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INSTITUTE FOR DEFENSE ANALYSES

U.S. Government Technology Information Locator

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PREFACE

This document was prepared by the Institute for Defense Analysis (IDA) under the task order entitled "Militarily Critical Technologies List (MCTL) and International Technology Assessments." The work was supported by the Office of the Deputy Under Secretary of Defense for International and Commercial programs (DUSD(I&CP)).

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FOREWORD

This document is a starter set to help users locate U.S. government technology information. For convenience, it uses Internet addresses, e-mail addresses, and telephone numbers.[1] It is not exhaustive, definitive, or a certified complete reference. Other federal data resources do exist or are being created.

The purpose of this document is to save readers time and to introduce them to a variety of existing federal data sources that they may find helpful. We invite readers to browse through it and then use it when need arises.

One caution: Expect changes in these federal listings and their content. Readers should not let the rate of change disturb them or lead them to conclude that this document is dead on arrival for lack of currency. We have all become somewhat accommodating to institutional change over the years. Departments merge, disappear, are invisibly absorbed, or have their names and office symbols changed for reasons that are not apparent. We just learn those new names and abbreviations and move forward. When compared with the rate at which governmental institutions change their symbols and identities, similar changes in Internet identities tend toward the fickle and unstable end of the spectrum. Some webmasters change their Uniform Resource Locator (URL)—the resource locator address string that begins with http://—a couple times per week. Sometimes they leave digital tracks that users can follow to the new location; sometimes they do not.

Your comments on the utility of this document are invited. Come by, call, or send them to:

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[1] The Internet addresses—for example, [http://www.doc.gov]—and the e-mail addresses—for example, [radius@rand.org]—have been enclosed in brackets to avoid confusion with sentence marks of punctuation. The appendix (see page A-1) contains a list of Internet addresses for departments/ agencies/programs called out in this document.

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TABLE

SUMMARY

The federal government obligates approximately $70 billion every year for research and development (R&D). There are 25 federal departments and agencies funding science and technology (S&T) programs; however, only 7 account for the vast majority—about 95 percent—of annual federal R&D authorizations for federally supported R&D activities. The seven agencies in descending order of S&T expenditures are:

1. The Department of Defense (DoD)
2. The Department of Health and Human Services (HHS)
3. The National Aeronautics and Space Agency (NASA)
4. The Department of Energy (DOE)
5. The National Science Foundation (NSF)
6. The United States Department of Agriculture (USDA)
7. The Department of Commerce (DOC).

This document provides information on the seven top federal R&D performers.

Each of these agencies, with the exception of DOC, had R&D budgets that exceeded $1 billion dollars in the last 5 years. The S&T efforts by NASA and DOE defense and basic science programs provide significant support to the DoD research, development, and acquisition programs. The HHS also has S&T programs in its National Institutes for Health (NIH) that are relevant to DoD programs in peacetime and wartime (medical treatment and the chemical and biological defense areas). The DOC is a recent addition to the list of top R&D performers. Nearly all of the DOC gain is attributed to the National Institute of Standards and Technology (NIST) Advanced Technology Program (ATP), which was designed to form partnerships between industry and the government to develop and exploit high-risk, enabling technologies. Although the ATP focus is on improving U.S. competitiveness and is for commercial applications, many of the ATP programs have the potential to support DoD programs. Government R&D spending is a small portion—approximately 5 percent—of the federal budget; however, it accounts for nearly 14 percent of annual discretionary spending.

All R&D efforts within the federal government are described as three stages of activity:

1. **Basic research.** Basic research produces knowledge and a better understanding in a science or engineering area. It is a long-term investment. Universities perform over half of DoD's basic research. Scientists and engineers at DoD laboratories also perform basic research. DoD has also placed a portion of the program in industry, non-profit research institutes, and other federal laboratories. Basic research does not guarantee that a particular scientific result will lead to any military application.

2. **Applied research.** Applied research is aimed at gaining the knowledge and understanding needed to determine how new technology can meet a specific, recognized need. The applied research program matures technologies for military use. Applied research provides proof of concept and evaluations built around models and laboratory experiments.

3. **Advanced technology development.** Advanced technology development also matures technologies through demonstrations of fielded prototypes, including evaluations by operational units in a field environment.

These stages of activity, which are defined by the Office of Management and Budget (OMB) Circular A-11, correspond to the traditional concept that innovation occurs in sequential steps—from scientific breakthroughs in basic research, which lead to taking this new knowledge to determine the means by which a specific need can be met or applied to research. This, in turn, leads to a specific application of technology or development with the intent to produce useful materials, devices, or systems, including the prototypes, methods, and process needed for production. The conduct of R&D does not include routine product testing; quality control; mapping; collecting general-purpose statistics; experimental production, routine monitoring; evaluating an operational program; or training personnel. Also, independent research and development (IR&D) that is allowed as a matter of course for private firms performing work for the DoD is not included.

Most of the federal S&T efforts are open or unclassified and can be accessed through DOC's National Technical Information Service (NTIS) [http://www.ntis.gov]. Those with limited access or that are proprietary in nature require clearance from the sponsoring agency. DoD, NASA and DOE limited access/classified S&T bibliographic information can be accessed through the Defense Technical Information Center (DTIC). DTIC has the responsibility acquire and disseminate information on all DoD S&T efforts, including ongoing programs; however, DTIC is dependent on the R&D performing activity to report this information.

DTIC has expressed two concerns regarding the S&T data gathering and information system:

1. Although all DoD research organizations are required to report R&D actuivities, some S&T activities are not doing so.

2. Once reported, there is no requirement to continually update these activities even though many are multi-year research efforts and, in some cases, changing baselines.

To get information on a specific project or technology area or its application, it is important to understand who performs the R&D and the type or nature of R&D activity. Who performs a specific R&D program is often dependent on the nature of R&D activity; whether this activity is basic research, applied research, or advanced technology development; and the specific technology area in which this R&D takes place. The management of R&D within DoD is also driven by the type of research activity. The management of all DoD R&D activity is the responsibility of the Under Secretary of Defense for Acquisition and Technology (USD (A&T)). Basic and applied research programs are the responsibility of the Director for Defense Research and Engineering (DDR&E). The Deputy Under Secretary for Advanced Technology (under USD (A&T)) is responsible for advanced technology development programs, which includes creating and overseeing advanced concept technology demonstrations (ACTDs). DoD-sponsored basic and applied research programs are defined and available on the DDR&E Internet Homepage [http://www.dtic.mil/ddre]. Management of these programs is generally controlled at OSD within the USD (A&T), with the Services and Defense Agencies responsible for the conduct of the programs. Unfortunately, DoD development activities, although managed at the OSD level, do not have a central location to get in-depth S&T information on the conduct of ongoing research efforts within the Services and Defense Agencies responsible for the programs.

A good approach for getting specific information on a military department or Defense Agency S&T program is by examining the Department's research, development, test, and evaluation (RDT&E) budget submission to OMB and the President's Budget to Congress. The DoD budget provides summary information of each Service and Defense Agency RDT&E budget by type activity. The DoD budget also provides detailed information on each R&D program identified by the program element (PE) for each Service and Defense Agency. As an example, for the Army under its basic research program, there is a separate program element for major research areas. PE 0602105A is for Material

Technology. The budget exhibit provides information for the last two fiscal years plus what is requested for next year's budget.

The Fiscal Year Budget of the U.S. government and its appendix contain the budget message of the President, including the administration's R&D priorities and detailed information for individual Department and Agency programs. The budget appendix includes for each Department and Agency the proposed text of appropriations language, budget schedule, new legislative proposals, and an explanation of the work to be done. The President's Budget includes a separate chapter on research, including budget authority by Department, by R&D type, and share for defense and civilian purposes. The budget is available on CD-ROM and in several electronic formats on the Internet at [http://www.access.gpo.gov/su_docs/budget/index.html]. For more information on access to the budget documents, call 888-293-6498. The DoD budget documentation is also available in electronic format and can be accessed on the Internet at [http://www.dtic.mil/comptroller].

I. DEPARTMENT OF COMMERCE (DOC)

The DOC is the smallest cabinet agency; however, it is the seventh largest in terms of federal spending for research and development (R&D). It accounts for approximately $1.021 billion or 1.4 percent of the federal total spending for FY 1998.

The DOC's mission is to promote job creation, economic growth, sustainable development, and improved living standards for all Americans by working in partnership with business, universities, and communities. The DOC works toward that mission by:

- Building for the future and promoting U.S. competitiveness in the global marketplace

- Strengthening and safeguarding America's economic infrastructure

- Keeping America competitive with cutting-edge science and technology (S&T) and an unrivaled information base

- Providing effective management and stewardship of America's resources and assets to ensure sustainable economic opportunities.

The DOC was established in 1903 to promote American business and trade, and today the DOC has a broad range of responsibilities. These include:

- Expanding U.S. exports

- Developing innovative technologies

- Gathering and disseminating statistical data and research reports for the federal government

- Measuring economic growth

- Granting patents

- Predicting the weather and managing the nation's coastal and marine resources

- Advancing the nation's telecommunications and information infrastructure.

The DOC is comprised of a diverse group of organizations (14 separate bureaus). The key functional organizations that would be useful for S&T researchers can be divided into three major focus areas:

1. Business and trade

2. Economy and statistics

3. Science and technology (S&T).

All DOC organizations are accessible through the DOC Internet Homepage at [http://www.doc.gov].

BUSINESS AND TRADE

Bureau of Export Administration (BXA)

The BXA administers the Export Administration Act by developing export control policies, issuing export licenses, and prosecuting violators. It also controls exports for national security, foreign policy, and short-supply reasons and administers the Defense Production Act for industry-related issues. BXA's Internet address is [http://www.bxa.doc.gov].

Economic Development Administration (EDA)

The EDA was established under the Public Works and Economic Development Act of 1965 to generate new jobs, help retrain workers, and stimulate industrial and commercial growth in economically distressed areas. EDA's Internet address is [http://www.doc.gov/eda].

International Trade Administration (ITA)

The ITA's mission is to encourage, assist, and advocate U.S. exports. It maintains 134 overseas offices and commercial centers in 69 countries and ensures that U.S. business has equal access to overseas markets. ITA's Internet address is [http://www.ita.doc.gov].

ECONOMY AND STATISTICS

Bureau of Economic Analysis (BEA)

The BEA is the nation's accountant for economic growth. It integrates and interprets raw economic data to draw a complete and consistent picture of the U.S. economy at the regional level and to compare our economy to the world economy. The BEA provides a quantitative view of production, distribution, and use of the nation's output. BEA data are on-line. BEA's Internet address is [http://www.bea.doc.gov].

U.S. Census Bureau

The Census Bureau is responsible for collecting data on population and demographics, on federal expenditures (i.e., R&D spending and industry census), and on production and capacity. The Census Bureau's Internet address is [http://www.census.gov].

SCIENCE AND TECHNOLOGY (S&T)

National Oceanic and Atmospheric Administration (NOAA)

NOAA's mission is to describe and predict changes in the Earth's environment and to conserve and manage the nation's coastal and marine resources. NOAA's Internet address is [http://www.noaa.gov].

Patent and Trademark Office (PTO)

The PTO is responsible for administering patent and trademark laws. The PTO maintains a U.S. patent database, which is accessible on the Internet. PTO's Internet address is [http://www.uspto.gov].

Technology Administration (TA)

All the key TA organizations listed below are accessible from the TA Internet Homepage at [http://www.ta.doc.gov].

- **National Institute of Standards and Technology (NIST).** NIST promotes economic growth by working with industry to develop and apply technology, measurements, and standards. NIST's Internet address is [http://www.nist.gov].

- **National Technical Information Service (NTIS).** NTIS collects and disseminates scientific, technical, engineering, and related business information produced by the U.S. government and foreign sources. NTIS' Internet address is [http://www.ntia.doc.gov].

- **The Office of Technology Policy (OTP).** Within the federal government, this office has the mission of developing and advocating national policies that use technology to build America's economic strength. OPT's Internet address is [http://www.ta.doc.gov/OTPolicy/default.htm].

Although some of these organizations are not directly related to S&T, they provide information on economic and industry statistics, export policies, and industry demographics. The DOC maintains an on-line database called STAT-USA, which provides

useful information on trade, the economy, and economic/production statistics. It also provides access to a global procurement market place.

II. DEPARTMENT OF DEFENSE (DoD)

DoD's research and development (R&D) budget authority for FY 1998 is $36,659.2 million. This total accounts for half of the total federal R&D budget authority. However, DoD's total S&T budget authority of $4.01 billion accounts for only 13 percent of the total FY 1998 federal budget for basic and applied research. The development portion of the DoD R&D accounts for 89 percent of the total DoD R&D budget and over 78 percent of all federal R&D funding for development R&D activities. Most of the funds are directed toward industry.

This funding profile makes DoD unique to the other federal agencies R&D programs. For FY 1998, DoD ranks fifth behind DOE, HHS, NASA and the United States Department of Agriculture (USDA) in total basic research, with $1.042 billion authorized, and second in applied research funding behind HHS, with $2.996 billion authorized.

DoD's R&D activities fall into two broad areas:

1. **The DoD Science and Technology (S&T) program.** This program includes basic research, applied research, and advanced technology demonstrations (ATDs).

2. **The DoD Development programs.** These programs include the application of research for the production of defense materiel: weapons systems and other support items to be fielded by the Services and Defense agencies.

The Under Secretary of Defense for Acquisition and Technology (USD (A&T)) is responsible for managing DoD's Science and Technology (S&T) and Development programs. USD (A&T)'s Internet address is [http://www.acq.osd.mil].

DEPARTMENT OF DEFENSE (DoD) SCIENCE AND TECHNOLOGY (S&T) PROGRAM

Overview

The DoD Science and Technology (S&T) program is the cornerstone of national military strategy. A fundamental assumption of the U.S. national military strategy is that the armed forces should be technologically superior to any potential opponent. In peace,

technological superiority is a key element in deterrence. In crisis, it provides a wide spectrum of options to the National Command Authorities (NCA) and Commanders in Chief (CINCs). In war, it enhances combat effectiveness, reduces casualties, and minimizes losses of critical defense materiel. Maintaining a technological edge has become even more important as the size of U.S. force structure decreases and high-technology weapons become available on the world market.

The objective of DoD's S&T strategy is to develop options for future decisive military capabilities based on superior technology. A critical goal of DoD's S&T program is ensuring affordability through the use of commercial technology—where appropriate—and developing technologies that reduce the acquisition, operation, and maintenance costs of a weapons system. The *Joint Vision 2010* report has developed a conceptual template to guide DoD's S&T programs and the development of critical military capabilities through new operational concepts:

- **Dominant maneuver.** Dominant maneuver is the multidimensional application of information and maneuver capabilities to provide coherent operations of air, land, sea, and space forces.

- **Precision engagement.** Precision engagement is the capability to locate the enemy accurately, to command and control (C2) friendly forces, to attack key enemy forces or capabilities precisely, and to assess the level of success accurately.

- **Full dimensional protection.** Full dimensional protection is the ability to protect our forces at all levels and obtain freedom of action while they deploy, maneuver, and engage an adversary.

- **Focused logistics.** Focused logistics is the capability to respond rapidly to crisis, shift warfighting assets between geographic regions, monitor critical resources en route, and deliver tailored logistics at the required level of operations.

Funding

Congress authorizes and appropriates funds for defense S&T in three categories:

1. **Basic research (6.1 account).** Basic research produces knowledge and a better understanding in a science or engineering area. It is a long-term investment. Universities perform over half of DoD's basic research. Scientists and engineers at DoD laboratories also perform basic research. DoD has also placed a portion of the program in industry, non-profit research institutes, and

other federal laboratories. Basic research does not guarantee that a particular scientific result will lead to any military application.

2. **Applied research (6.2 account).** Applied research is aimed at gaining the knowledge and understanding needed to determine how new technology can meet a specific, recognized need. The applied research program matures technologies for military use. Applied research provides proof of concept and evaluations built around models and laboratory experiments.

3. **Advanced technology development (6.3 account).** Advanced technology development also matures technologies through demonstrations of fielded prototypes, including evaluations by operational units in a field environment.

Structure and Management

The Director, Defense Research and Engineering (DDR&E) is responsible—with the exception of advanced technology development—for the development, direction, priorities, quality, and content of the S&T program. DDR&E ensures that the program responds to the needs of the warfighters and to the national military goals embraced by the department's S&T strategy. DDR&E's Internet address is [http://www.dtic.mil/ddre].

The Deputy Under Secretary for Advanced Technology (under USD (A&T)) is responsible for advanced technology development programs, which includes creating and overseeing advanced concept technology demonstrations (ACTDs). USD (A&T)'s Internet address is [http://www.acq.osd.mil].

The Director, Defense Research and Engineering (DDR&E) and the Science and Technology (S&T) Program

The DDR&E organizations that play key roles in DoD's S&T program include the:

- **Defense Advanced Research Projects Agency (DARPA).** DARPA is DoD's central R&D organization. It manages and directs selected basic and applied R&D projects and pursues research and technology (R&T) where risks and payoff are high. DARPA's Internet site provides a description of each of DARPA's technical and support offices and contains links to their individual web sites. Each technical office site provides specific information about its mission, personnel, programs and solicitations. DARPA's Internet address is [http://www.darpa.mil].

- **Defense Modeling and Simulation Office (DMSO).** DMSO was established to provide a full-time focal point for information concerning DoD modeling and simulation (M&S) activities. DMSO provides M&S services

include a Modeling and Simulation Resource Repository (MSRR), a Defense Modeling, Simulation, and Tactical Technology Information Analysis Center (DMSTTIAC), and a Modeling and Simulation Operational Support Activity (MSOSA). The DMSO Internet site provides information about and links to DMSO projects, the DMSO library, and other M&S organizations and groups. DMSO's Internet address is [http://www.dmso.mil].

- **High-Performance Computing and Modernization Office.** The High-Performance Computing and Modernization Office manages DoD's High-Performance Computing Modernization Program (HPCMP). HPCMP's mission is to modernize the total high-performance computational capability of the DoD S&T program, the Development, Test and Evaluation (DT&E) program, and the Ballistic Missile Defense Organization (BMDO) to a level comparable to that available in the foremost civilian and other government R&D organizations. The High-Performance Computing and Modernization Office operates major shared resource centers and manages the development of common high-performance computing (HPC) software available to support the entire DoD HPC user community. Distributed centers also provide HPC support to specific local and remote sites. The High-Performance Computing and Modernization Office also operates the Defense Research and Engineering Network (DREN), a robust high-speed network geared to support the Department's computational communications needs. The High-Performance Computing and Modernization Office's Internet address is [http://www.hpcmo.hpc.mil].

- **Strategic Environmental Research and Development Program (SERDP).** SERDP is DoD's corporate environmental R&D program. SERDP works in partnership with DOE and the Environmental Protection Agency (EPA) and focuses on cleanup, compliance, conservation, and pollution-prevention technologies. SERDP's Internet site provides information on organizational structure, personnel, and program thrust areas. SERDP's Internet address is [http://www.hgl.com/SERDP].

- **Laboratory Management and Technology Transition (LM&TT) Office.** The Director for LM&TT is responsible for the stewardship and oversight of DoD and component laboratories, the DoD Manufacturing Technology Program (ManTech), Small Business Innovation Research (SBIR), the Independent Research and Development (IR&D) program, and the Defense Information program. In addition, LM&TT cooperates within DoD to promote technology transfer (TechTRANSIT). The LM&TT Internet site offers links to each of its program offices, LABLINK, DoD laboratories, Federally Funded Research and Development Centers (FFRDC's), Service S&T organizations and laboratories, federal government R&D organizations,

and international government and commercial S&T-related web sites. LM&TT's Internet address is [http://www.dtic.mil/labman].

- **The Dual-Use Applications Program (DUAP).** DUAP is a joint program of the Services, DARPA, DDR&E, and the Deputy Under Secretary of Defense for International and Commercial programs (DUSD (I&CP)) to prototype and leverage commercial research, technology, products and processes into military systems. DUAP will enable the Services to leverage commercial R&D for more effective, affordable, and sustainable military systems. DUAP's Internet address is [http://www.darpa.mil/jdupo/ duap.html].

  DUAP consists of two programs/initiatives to encourage the dual-use technologies:

  - The Commercial Operations and Support Savings Initiatives (COSSI) will prototype methods for reducing DoD operations and support (O&S) costs by inserting commercial products into fielded military systems. COSSI's Internet address is [http://www.darpa.mil/jdupo/cossi.html].

  - The Congressionally mandated DUAP Science and Technology (S&T) Initiative funds the development (6.2 account: Applied Research) of militarily useful, commercially viable technologies to reduce costs and increase performance and sustainment of defense systems. Congress will require each Service to fund—at a minimum—5 percent of their authorized applied research funding to the DUAP S&T initiative. Information about this initiative can be found at [http://www.darpa. mil/jdupo/st.html].

All these organizations and other useful information regarding the conduct of DDR&E's S&T programs are accessible through the DDR&E Internet Homepage (http://www.dtic.mil/ddre]. Other useful information that can be accessed from the DDR&E web site is:

- DDR&E offices, mission statements, program information, and directories

- S&T budget and program information

- Briefings, speeches, articles, and papers relevant DoD's S&T program

- All DoD/Service activities and laboratories involved in S&T

- R&D descriptive summaries from the Services and defense agencies

- Key DoD S&T planning and strategy documents, including:
  - S&T strategy
  - FY Joint Warfighter S&T Plan (JWSTP)

- FY Defense Technology Area Plan (DTAP)
- FY Defense Technology Objectives (DTOs)
- FY Basic Research Plan (BRP)
- Advanced Battlespace Information System (ABIS) Task Force Report
- *Joint Vision 2010*
- Air Force Technology Area Plans
- Army Science and Technology Master Plan
- Navy Science and Technology Requirements Guide.

The military departments and the defense agencies are responsible for planning, programming, and conducting the S&T programs within their purview. The Services use their S&T programs to provide warfighting and system options for their components. The Defense agencies are responsible for certain multi-Service aspects of S&T and for designated programs that support national security objectives.

The Defense Technical Information Center (DTIC), which is under DDR&E, is responsible for acquiring, archiving, and disseminating DoD science and engineering information. This document presents DTIC information in a separate section.

The Deputy Under Secretary for Advanced Technology and the Department of Defense (DoD) Advanced Concepts Technology Demonstration (ACTD) Program

The ACTD S&T program is managed by the Deputy Under Secretary of Defense for Advanced Technology, whose Internet address is [http://www.acq.osd.mil/at].

Each ACTD is managed by a lead Service or Defense Agency developer and is driven by the principal user-sponsor, typically a unified commander. ACTDs exploit mature advanced technologies to solve important military problems and incorporate new technologies into prototypes that can be fielded and placed into the hands of warfighters for evaluation. The objectives of the ACTDs are to conduct meaningful demonstrations, develop and test concepts of operations to optimize military effectiveness, and prepare to transition the capability into acquisition without a loss of momentum. ACTDs are structured to address the needs of the warfighter, provide needed capabilities, address deficiencies, and reduce costs and/or manpower requirements. Each ACTD is aimed at one or more warfighting objectives and is reviewed by the Services, defense agencies, and the

Joint Staff. Several key criteria against which ACTDs are evaluated include response to user needs, maturity of the technologies, and potential effectiveness.

Information about the ACTD program can be found at the Internet Homepage for the Deputy Under Secretary of Defense for Advanced Technology [http://www.acq.osd.mil/at]. Information that can be accessed from this web site includes:

- ACTD program introduction, milestones, history, and focus

- ACTD guidance, management, responsibilities, and description of the ACTD classes

- Guidelines for ACTD management plans and transition considerations

- ACTD program initiation, including a programmatic and organizational approach

- ACTD descriptions for the current fiscal year and last two fiscal years, including a point of contact (POC), program description, milestones, concept of operations (CONOPS), and technical approach.

DEPARTMENT OF DEFENSE (DoD) DEVELOPMENT PROGRAMS

The Office of Management and Budget (OMB) circular A-11 defines development R&D as "the systematic use of the knowledge or understanding gained from research directed toward the production of useful materials, devices, systems, or methods, including the design and development of prototypes and processes." The DoD Development program is directed primarily at weapons systems acquisition and supporting defense materiel.

No single source for information on DoD-wide development programs exists, other than DTIC (see Section IV). DTIC's mission is to provide a source of Scientific and Technical Information Program (STIP) services to assist in carrying out the department's STIP policy and management responsibilities, to operate DoD-wide scientific and technical information (STI) systems, and to act as a central coordinating point for DoD STI databases and systems. DTIC's governing regulation is DoD Directive 3200.12, *DoD Scientific and Technical Information Program*. DTIC maintains a bibliographic database of technical reports and the Work Unit Information Summaries covering ongoing DoD R&D activities.

The completeness of the files and the ability to update information once the project information is submitted to DTIC have raised concerns. Although R&D programs have a regulatory requirement to submit information to DTIC and DTIC has the mission to act as a central coordinating point for DoD databases, this is not always the case. Another concern

of program personnel is timeliness and currency of the data in DTIC files. For example, once information is submitted on a specific project, no requirement exists to update this information even though it may be active for several years. If these are valid concerns, they would present significant problems in trying to develop a coherent picture of DoD S&T efforts. A specific challenge would be how to maintain a current picture of critical ongoing programs, S&T applications and needs, and collaborative efforts underway within the DoD and federal R&D activities to support current R&D programs. Each Service and Defense Agency manages individual development programs without much current awareness of what the other Services/agencies are doing.

The Office of the Secretary of Defense (OSD) [http://www.defenselink.mil/osd] sponsors many programs. Some organizations that may help direct the researcher toward specific Service and agency programs include:

- **USD (A&T).** USD (A&T) is responsible for all matters concerning DoD's S&T programs and acquisition management of weapons systems and other defense materiel throughout the acquisition cycle, including development programs. In addition to DDR&E and the Deputy Under Secretary for Advanced Technology, USD (A&T) has several other offices responsible for the DoD's R&D programs. Although personnel in these offices may not have knowledge of specific S&T activities in each of the program offices and laboratories, they can provide important information on the acquisition program, activities involved, and key personnel to be contacted for more detailed information. USD (A&T)'s Internet address is [http://www.acq.osd.mil].

- **Principal Deputy Under Secretary of Defense for Acquisition and Technology (PUSD (A&T))**

  - *Directorate of Strategic and Tactical Systems.* The Strategic and Tactical Systems Directorate is responsible for the oversight, technical review, and evaluation of DoD development and acquisition programs in assigned mission areas. It is composed of seven offices with specific responsibilities for the following programs: Strategic and Tactical Systems; Theater Ballistic Defense Missile (TBMD) systems; National Missile Defense (NMD); Cruise Missiles; Tactical and Strategic Airlift; Tactical Land Systems; Tactical Naval Systems; Munitions; Electronic Warfare Programs; and Deep Strike Systems. The Directorate of Strategic and Tactical Systems' Internet address is [http://www.acq.osd.mil/sts].

  - *AcquisitionProgram Integration.* For the Secretary of Defense and USD (A&T), Acquisition Program Integration develops, evaluates, and recommends policies and procedures governing the operations of the

entire DoD acquisition system. It identifies major weapons system programs for the USD (A&T) and recommends these programs to the Defense Acquisition Board (DAB). The Acquisition Program Integration's Internet address is [http://www.acq.osd.mil/api].

- **Ballistic Missile Defense Organization (BMDO).** The BMDO Director is responsible for managing, directing, and executing the Ballistic Missile Defense (BMD) programs including Theater Missile Defense (TMD), NMD, and advanced BMD programs. BMDO's web site provides information on the BMDO organization, personnel, budget, document and report libraries, and fact sheets on specific ballistic missile programs. The web site also offers the BMDOLINK to related organizations and a search database for BMDO news. BMDO's Internet address is [http://www.acq.osd.mil/bmdo].

- **Assistant to the Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ATSD (NCB)).** The ATSD (NCB) is responsible for managing, directing, developing, and acquiring Nuclear, Chemical and Biological (NCB) defense programs. The Office of Counterproliferation and Chemical and Biological Defense (CP/CBD) within ATSD (NCB) is responsible for the advocating and accelerating the defense against chemical and biological weapons of mass destruction (WMD). The Counterproliferation Program Review Committee (CPRC) within CP/CBD is chartered to initiate and implement recommendations regarding interdepartmental activities and programs to address shortfalls in existing and programmed capabilities to counter the proliferation of NCB WMD and their delivery. The office also publishes the Congressionally mandated CPRC report to Congress. This report provides detailed information about ongoing and needed R&D efforts by the DoD and other related federal agencies. The report also includes R&D efforts for the consequence management solutions to the use of NCB WMD. Several other reports involving S&T and related research efforts are also available on this web site. Information about CP/CBD can be found at the CP/CBD web site [http://www.acq.osd.mil/cp/main.htm]. The CP/CBD Web is the Internet point-of-contact for United States Department of Defense Counterproliferation and Chemical Biological Defense Information.

  The ASTD (NCB) Internet site (accesed from the OSD Homepage: [http://www.defenselink.mil/osd]) provides links to information on counterproliferation. These links provide access to the White House, Congress, and U.S. government agencies, including DOE laboratories and DoD component laboratories involved in related S&T and development efforts. This site also provides information from the news media, with search capability.

- **Deputy Under Secretary of Defense for Space (DUSD (Space)).** DUSD (Space) is the principal OSD staff assistant advisor to the USD (A&T)

on space matters. DUSD (Space) is responsible for developing, coordinating, and overseeing the implementation of space policy. It also has oversight responsibility for space architectures and for space R&D and acquisition programs, including the Space-Based Infrared System (SBIRS), Military Satellite Communications (MILSATCOM), and the Global Positioning System (GPS). Specific information on the DUSD Space website includes information on mission, personnel, documents, reports, and space programs. The site also links into other DoD space-related organizations. DUSD (Space)'s Internet address is [http://www.acq.osd.mil/space].

- **Deputy Under Secretary of Defense (International and Commercial Programs) (DUSD (I&CP)).** DUSD (I&CP) serves as DoD's focal point for defense-related international R&D, production, and acquisition involving cooperation between the United States and governments or industries of allied and friendly nations. DUSD (I&CP) coordinates DoD bilateral armaments cooperation relationships with these nations. DUSD (I&CP)'s Internet address is [http://www.acq.osd.mil/icp].

The Directorate of Armaments Cooperation is a DUSD (I&CP) office that manages the International Cooperative Research and Development Program that incorporates defense cooperation across a full spectrum of acquisition activities, including requirements definition, concept development, R&D, production, procurement and follow-on support. The Directorate of Armaments Cooperation website provides information on cooperative R&D projects as defined in Section 2350 of Title 10 Chapter 138, a handbook for international armaments cooperation and the Military Critical Technologies List (MCTL). The Directorate of Armaments Cooperation's Internet address is [http://www.acq.osd.mil/icp/armscoop.html].

DUSD (I&CP) also supports DoD's Small and Disadvantaged Business Utilization (SADBU) office and the Defense Export Loan Guarantee (DELG) program.

- SADBU manages the SBIR program and the Small Business Technology Transfer Program (STTR) and other initiatives to promote DoD-sponsored research with small businesses. Both the SBIR and STTR fund approximately $500 million each year for early-stage R&D projects at small technology companies with a focus on projects that have commercial applications. The SADBU website provides information on the various programs and contains links and information to other DoD components and federal and state government agency SBIR and STTR programs. SADBU's Internet address is [http://www.acq.osd.mil/sadbu].

- The purpose of the DoD DELG program is to meet national security objectives by encouraging standardization and interoperability of defense

systems with our allies, lowering purchase costs of defense items to DoD, preserving critical defense skills, and maintaining the stability of the industrial base by facilitating the export of American-made products. Information about the DELG program can be found at Internet address [http://www.acq.osd.mil/icp/delg/defexploan.htm].

Many sites involved in defense systems and materiel acquisition and development programs and other R&D activities—including Service Program offices, DoD and other federal laboratories, and other organizations—can be accessed from DefenseLINK. Although current Service and OSD sites are incomplete, under construction, or do not exist, this situation will improve with time and with more standardized formats and content on the DoD and federal S&T programs. Some useful and informative sites for several Services acquisition and development organizations do provide detailed and in-depth information on their respective R&D programs, including collaborative efforts with universities, other federal agencies and laboratories, non-profit research organizations, and industry. DefenseLINK can be accessed through the DTIC Internet Homepage at [http://www.dtic.mil].

III. DEPARTMENT OF ENERGY (DOE)

The Department of Energy (DOE) is responsible for providing the science and technology (S&T) leadership needed to achieve efficiency in energy use and the diversification of energy sources needed for a more productive and competitive economy, improved environmental quality, and secure national defense. The foundation for these efforts is a strong S&T program.

DOE's annual research budget—over $5.5 billion—is the fourth largest budget behind the Department of Defense (DoD), the Department of Health and Human Services (HHS), and the National Aeronautics and Space Administration (NASA). Almost all the DOE research and development (R&D) funding is for basic and applied research.

DOE manages a $30-billion federally funded national laboratory system, with over 40,000 scientists and engineers. These laboratories perform world-class basic and applied research in the energy, high-speed computing, and national security areas. The laboratories are also active in collaborative efforts with energy-related private institutes, universities, and industry. Although the roots of DOE's laboratory system were based on the Manhattan Project and the development of nuclear weapons during and following World War II, DOE now supports a broad national S&T portfolio: supercomputing, oil and gas exploration applications, electronics, textile manufacturing, advanced materials, robotics, sensors and monitors, transportation, and basic research in physics and chemistry.

The DOE laboratories serve a distinctive role in conducting long-term, often high-risk R&D through the use of capital-intensive facilities that are normally beyond the reach of industry and academia. The mission areas of DOE's national laboratories are:

- **Energy.** The primary energy mission for the laboratories is to pursue a research and technology (R&T) development agenda that enhances the long-term prospects for adequate energy supplies and efficient end-use technologies that minimize adverse environmental impacts. The key role of the laboratories is long-term research that holds the promise of significant payoffs. The two separate research activities are Fossil Energy and Fusion Energy.

- **Environmental S&T.** The primary environmental S&T mission is the acceleration of the scientific and technology base and the development of affordable technologies for the clean-up of radioactive and hazardous waste at

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weapons production laboratories and national laboratories. Environmental S&T also seeks to make significant contributions in R&D for more efficient use of energy and materials, pollution prevention, waste minimization techniques in industrial processes, and the environmental impacts of energy use, including global climate modeling.

- **National security.** The national security mission is to develop technologies that enhance the ability of the nation to deter and defend against nuclear threats, reduce nuclear danger, and provide for a safe, secure, and reliable nuclear stockpile. This mission also supports work in non-proliferation, counter-proliferation, arms control verification, and intelligence.

The decade of the 1990's has effected substantial change for the department's nine multi-program national laboratories, particularly the department's three nuclear weapons laboratories. Sweeping geopolitical changes, limitations on nuclear testing, increased attention to economic competitiveness, and the continuing demands of energy development and environmental quality—in the context of tighter federal R&D budgets—confront the department's use of its laboratories for meeting national missions. DOE has restructured the laboratories and related field and headquarters organization to respond to these changes while maintaining core competencies and critical capabilities.

DOE also has a major mission to contribute to the scientific foundation that underpins the department's mission areas—energy, the environment, and national security, including discrete areas of science (i.e., high-energy, nuclear, and condensed matter physics)—by maintaining large-scale user facilities that the laboratories have designed and built.

DOE's mission, goals, and objectives and the descriptions of its program offices, organizational structure, national labs, and facilities can be found at DOE's Internet address [http://www.doe.gov].

SCIENCE AND TECHNOLOGY (S&T) RESEARCH

DOE's research missions and responsibilities are accomplished by several distinct—but separate—organizations. Each organization has responsibilities for conducting, managing, and reporting DOE's S&T efforts. DOE also has a Secretary of Energy Advisory Board (SEAB), whose mission is to provide the Secretary of Energy advice, information, and recommendations on the department's basic and applied research activities.

The organizations involved in the DOE S&T program are:

- **The Office of Energy Research (OER).** OER programs fund basic research to advance the fundamental science knowledge base and train future

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scientists. Research includes the natural and physical sciences, materials and chemical science, engineering and geosciences, energy biosciences, magnetic fusion energy, high-energy and nuclear physics, health and environment, and computational and technology research in mathematical, informational, and computational sciences. Although several S&T information sources are available from the DOE Internet Homepage, OER is responsible for the dissemination of S&T information through its Office of Scientific and Technical Information (OSTI), a division under the Office of Computational and Technology Research. OER's Internet address is [http://www.er. doe.gov].

The key (S&T) Program Management offices/programs under the OER—all of which can be accessed from OER's Internet Homepage—are:

— *Office of High Energy and Nuclear Physics.* The Office of High Energy and Nuclear Physics operates large world-class scientific facilities for the nation. It manages an annual $1-billion basic research program that provides new insights into the nature of energy and matter. The Office of High Energy and Nuclear Physics' Internet address is [http://www. er.doe.gov/production/henp/henp.html].

— *Office of Basic Energy Sciences.* The Office of Basic Energy Sciences supports research to advance the scientific knowledge, technical know-ledge, and skills needed to develop and use new and existing energy resources in an economically viable and environmentally sound manner. Areas of interest are materials science, chemical science, energy bio-sciences, geosciences, and engineering. The Office of Basic Energy Sciences' Internet address is [http://www.er.doe.gov/production/bes/ bes.html].

— *Office of Biological and Environmental Research.* The Office of Biological and Environmental Research is responsible for developing the knowledge needed to identify, understand, and anticipate the long-term health and environmental consequences of energy production, development, and use. The Office of Biological and Environmental Research's Internet address is [http://www.er.doe.gov/production/ober/ ober_top.html].

— *Fusion Energy Program.* The Fusion Energy Program is responsible for advancing plasma science, fusion science, and fusion technology to build the knowledge base for an economically and environmentally attractive fusion energy source. The Fusion Energy Program's Internet address is [http://wwwofe.er.doe.gov].

— *Office of Planning and Analysis.* The Office of Planning and Analysis provides the strategic plans and strategies of OER research efforts. It also

performs cost/benefit analysis to ensure the quality of selected R&T programs and maximize payoffs to the U.S. S&T program. The Office of Planning and Analysis' Internet address is [http://webster.er.doe.gov/er-5/home.html].

- *Office of Laboratory Policy and Science Education.* The Office of Laboratory Policy and Science Education is responsible for maintaining and operating the DOE laboratories. The office also manages DOE's institutional planning, policy and processes, university and science education programs, and infrastructure management. The DOE laboratory complex, which lists each laboratories' capabilities and core compe- tencies, can be accessed from OER's Internet Homepage. The Office of Laboratory Policy and Science Education's Internet address is [http://www.er.doe.gov/production/er-07/index.html].

- *Office of Computational and Technology Research (OCTR).* OCTR is responsible for the long-term computational and technology research for applied mathematical sciences, high-performance computing, communi- cations, and infrastructure. The office manages DOE's Technical Infor- mation Management Program, which provides direction and coordination for the management and dissemination of scientific and technical information resulting from the DOE's R&D and environmental programs. OCTR also manages DOE's Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. OCTR's Internet address is [http://www.er.doe.gov/production/octr/octr.html].

OCTR has three separate divisions:

- -- *Advanced Energy Products and Technology Research Division (AEPTR).* The Laboratory Advanced Energy and Technology Research Division explores the scientific feasibility of novel energy- related concepts. These concepts are at an early stage of scientific development and are considered premature for consideration by applied research or technology development programs. It also manages the DOE's SBIR and STTR programs. The AEPTR Division's Internet address is [http://www.er.doe.gov/production/ octr/aeptr/aeptr_pr.html].

- -- *Office of Scientific and Technical Information (OSTI).* OSTI, located in Oak Ridge, Tennessee, is the central point for collection, processing, and dissemination the scientific and technical infor- mation (STI) generated and acquired by the DOE programs. OSTI serves as DOE's central point for collecting and sharing scientific and technical information. OSTI's Internet address is [http://www. osti.gov].

-- *Mathematical, Information, and Computational Division.* The Mathematical, Information, and Computational Division manages DOE's High-Performance Computing and Communications (HPCC) program and DOE's performance computing resource centers. It conducts research in the areas of advanced software technology and algorithms and information infrastructure technology and applications. The Mathematical, Information, and Computational Division's Internet address is [http://www.er.doe.gov/production/octr/mics/index.html].

- **Office of Defense Programs (DP).** The mission of the Office of Defense Programs is to ensure—without nuclear testing—the safety, reliability, and performance of the nuclear weapon stockpile. It is responsible for providing the infrastructure and intellectual capability to maintain a nuclear weapon stockpile—including the replacement of limited-life components and ensuring an adequate supply of tritium—and for providing the capability to reconstruct underground testing and weapons production capability as required to meet national security needs. Access to DP Internet information requires registration; however, some fact sheets on lab facilities and the national ignition/tritium projects can be accessed on-line through the Internet DOE-DP access. The Office of Defense Programs' Internet address is [http://www.dp.doe.gov].

  The Office of Defense Programs has four departments at the Deputy Assistant Secretary level and a project office headed by a Military General Officer:

  - Research and Development Department

  - Strategic Computing and Simulation Department

  - Military Applications and Stockpile Management Department

  - Program Support Department

  - Tritium Project Office.

- **Chief Financial Officer (CFO).** The DOE CFO is responsible for the R&D tracking database used to report to the White House Office of Science and Technology and for the Research and Development in the United States (RaDiUS) database (see Section XV). RaDiUS provides access to over 12,000 ongoing R&D projects within DOE. It provides a complete abstract of project sponsor, point of contact (POC), description, deliverables, and so forth. Users must register and be approved by the CFO. The CFO also provides names and e-mail addresses for all DOE program officers who are R&D tracking "stakeholders" within the headquarters and field program offices. The R&D tracking system is currently the only source of new and ongoing R&D within DOE. OSTI is currently working to have an enhanced

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R&D tracking system available. The CFO's Internet address is [http://www.cfo.doe.gov].

- **Energy Efficiency and Renewable Energy (EE) Office.** The mission of the EE Office is to lead the nation to a stronger economy, a cleaner environment, and a more secure future through the development and deployment of sustainable energy technologies. EE strives to achieve these goals through a balanced R&D program and deployment through private sector enterprises.

   The EE Office has four Deputy Assistant Secretary Offices and a Program office:

   - Utility Technologies Office

   - Industrial Technologies Office

   - Building Technologies, State, and Community Programs Office

   - Transportation Technologies Office

   - Federal Energy Management Program Office.

   The EE Internet address is [http://www.eren.doe.gov]. This site provides information on program efforts, names, and e-mail addresses. The EE Office also maintains an on-line database, Alternative Fuels Data Center. The Alternative Fuels Data Center's Internet address is [http://www.afdc.nrel.gov].

- **Secretary of Energy Advisory Board (SEAB).** The SEAB is chartered to provide the Secretary of Energy with independent and expert advice on a broad range of energy, environmental, and public policy issues. The SEAB replaced the Energy Research Advisory Board in 1990 as the principal scientific advisory committee to the DOE. The SEAB's mission is to provide advice, information, and recommendations to the Secretary of Energy on DOE's basic and applied research activities, economic and national security policy, educational issues, or any other activities/operations that the Secretary may direct. Most work is done through a task force. Copies of recent reports are available through the DOE Internet Homepage at [http://www.doe.gov].

INFORMATION RESOURCES

DOE has a number of on-line databases, some of which are specialized networks for specific fields of study, program offices, or laboratory communication links. Many have information, reports, and other documentation on-line and/or the ability to order the documents.

OSTI is responsible for disseminating official DOE S&T reports. The CFO is also responsible for tracking ongoing R&D and currently manages the department's only R&D database of ongoing S&T projects. The Energy Information Administration (EIA) is an independent statistical and analytical agency within DOE. EIA maintains a comprehensive data and information program relevant to energy sources and reserves, energy production, energy demand, energy technologies, and other related statistical information.

Some of the products offered by DOE information organizations are as follows.

- OSTI provides information on the international S&T efforts through the International Energy Agency (IEA), the Energy Technology Data Exchange (ETDE), and the International Atomic Energy Agency's (IAEA) International Nuclear Information System (INIS). For more information, visit the ETDE Internet Homepage at [http://www.etde.org] and the IAEA Internet Homepage at [http://www.iaea.org]. Other international products can be accessed through the OSTI Internet Homepage at [http://www.osti.gov].

OSTI products and services include but are not limited to:

- *Technical reports.* The DOE Reports Bibliographic Database contains citations for the department-sponsored scientific and technical reports covering the period of January 1, 1994. These can be purchased through the National Technical Information Service (NTIS) (703-487-4650).

- *Energy information on-line.* The department's two major databases, Energy Science and Technology and Nuclear Science Abstracts, can be accessed through commercial on-line systems [i.e., DIALOG (800-334-2564) and STN International (800-848-6533]. These databases provide complete bibliographic information and abstracts for technical reports, journal articles, conference papers and proceedings, patents, books, and so forth.

- *Compact discs (CDs).* The Energy Science and Technology (from 1974 to the present and is updated quarterly) and Nuclear Science Abstracts (from 1948–1976, historical only) databases are also available on compact disc from DIALOG (800-334-2564). The IEA Technology Data Exchange, which covers information from 1987 to the present, is also available from a commercial source, SilverPlatter (800-343-0064).

- *Software.* Energy Science and Technology software is available at the OSTI Internet address [http://www.osti.gov].

- *Virtual library.* The Energy Science and Technology Virtual Library is prototype that provides desk-top access to information collections, electronic journals and preprints, applied and engineering standards, database and document delivery services, regulatory, funding and

reference material. The virtual library can be accessed at the DOE Internet address [http://www.doe.gov].

- *Publications.* Recent reports on DOE R&D reports are available through NTIS (703-487-4650).

- EIA maintains a comprehensive data and information program on energy demand, production, technologies, resources, energy markets and reserves and on specific fuel groups. A complete listing of products, services, and types of information is available at the EIA Internet Homepage at [http://www.eia.doe.gov].

Some of the types of products and services offered are:

- *STAT-USA.* STAT-USA provides selected publications and electronic files through the EIA Internet Homepage.

- *Listserve.* Listserve makes press releases, many weekly and monthly data files, and notifications on the release of selected documents available through e-mail.

- *EIA Electronic Publishing System (EPUB).* EPUB is a free bulletin board accessible via modem. For more information, call 202-586-2557.

- *National Energy Information Center (NEIC).* EIA's NEIC provides energy information and referral services. For more information, call 202-586-8800 or e-mail at [infoctr@eia.doe.gov].

IV. DEFENSE TECHNICAL INFORMATION CENTER (DTIC)

The Defense Technical Information Center (DTIC) is a major component of the Department of Defense (DoD) Scientific and Technical Information (STI) program. DTIC is the one single source for DoD-wide unlimited- and limited-access/classified science and technology (S&T) activity reports and bibliographic research and development (R&D) report citations.

MISSION

DTIC's mission is to provide a source of Scientific Technical Information Program (STIP) services to assist in carrying out DoD STIP policy and administration, to perform technical information support services for the Office of the Secretary of Defense (Acquisition and Technology) (OSD (A&T)), to operate DoD-wide Scientific STI systems, and to act as a central coordinating point for DoD STI databases and systems. DTIC's governing regulation is DoD Directive 3200.12, *DoD Scientific and Technical Information (STI) Program (STIP), 11 Feb 98 AD-A336281)*

HOLDINGS

DTIC holdings include technical reports, management summaries at the work-unit level, independent R&D summaries, and special collections (i.e., captured German and Japanese documents that date back to World War II). The scope of the collection includes areas normally associated with defense research (i.e., military science, aeronautics, missile and space technology, and nuclear science). However, since DoD interests are wide-spread, the collection also contains information on subjects covering broad scientific areas (i.e., biology, chemistry, energy, environmental sciences, oceanography, computer sciences, sociology, logistics, and human factors engineering). DTIC also maintains special collections. Valuable information can be found in the Air Technical Index and Technical Information Pilot collections, which contain technical reports—foreign and domestic—dating back to the 1940's. These documents, many of which are the single remaining copy, are technically and historically significant. For information on the DTIC collection, phone 703-767-8040.

ACQUISITION EFFORTS

DTIC acquires scientific, technical, engineering, and management studies and other types of information—in any type media or format—to meet DoD's needs. DoD directives require that defense activities, their contractors, subcontractors, and grantees provide DTIC with copies of each technical report that records the results of defense R&D efforts. Ongoing and planned projects are also reported. DTIC makes special arrangements for acquiring reports that are not controlled by regulations or contractual agreements but represent technically significant additions to its collection.

SERVICES

DTIC contributes to the management and conduct of defense research, development, and acquisition efforts by providing access to and transfer of scientific and technical information, current awareness database products, and on-line and Internet services.

Access to Science and Technical Information

DTIC has DoD-wide responsibility for acquiring, storing, and disseminating scientific and technical information to aid in defense R&D. The DTIC collection is contained in the following scientific and technical information databases:

- **Technical Reports (TR) Bibliographic.** This collection contains nearly 2 million print and non-print (software, data files, databases, and video recordings) documents conveying the results of completed defense-sponsored research, development, test, and evaluation (RDT&E) efforts, including patent applications, studies, reports, and open source literature from foreign countries. The TR database's Internet address is [http://www.dtic.mil/dtic/dtic-o/oc/ocp].

- **Work Unit Information System (WUIS).** The WUIS database contains over 250,000 technically oriented management summaries that describe ongoing DoD R&T efforts at the work-unit level. This information concerns the what, where, when, how, at what costs, by whom, and under what sponsorship the research is being performed. It also includes summaries of completed and terminated efforts. The WUIS database's Internet address is [http://www.dtic.mil/dtic/dtic-o/wuis.html].

- **Independent Research and Development (IR&D).** The IR&D collection contains nearly 140,000 descriptions of projects initiated by DoD contractors but not required under contract. These IR&D projects are usually performed to improve existing DoD products, meet dual-use needs, or meet

what industry perceives to be "potential" DoD requirements. Proprietary information is accessible only to DoD and DoD-approved U.S. government organizations. The information is used to identify contractors with expertise in areas of interest to DoD. The IR&D database's Internet address is [http://www.dtic.mil/dtic/dtic-o/ird.html].

- **Manpower and Training Research Information System (MATRIS).** MATRIS is an automated decision support system designed to achieve joint service coordination of manpower, personnel, training, and human factors (MPT/HF) research. The MATRIS database includes references to program element and project descriptions, work unit and project and/or study summaries, DoD budget category breakdowns, descriptions of human systems integration, and Livewire tools and techniques. MATRIS also includes Merit Systems Protection Board report summaries and the Federal Aviation Administration (FAA) national plan for aviation human factors.

  The MATRIS service provides access to DoD's Technology Transfer database, the DoD Biomedical Research database, the Small Business Technology Transfer (STTR) system, and the Small Business Innovative Research (SBIR) Interactive Topic Information System (SITIS). MATRIS also provides a gateway service to organizations with related interest and a extensive POC listing of all researchers who perform/manage people-related research. MATRIS' Internet address is [http://www.dticam.dtic.mil]. The MATRIS POC can be reached at 619-553-7000 or at e-mail address [email@dticam.dtic.mil].

Access to Current Awareness Database Products

DTIC's current awareness database includes:

- **Current Awareness Bibliography (CAB)/Electronic Current Awareness Bibliography (ECAB).** The CAB and ECAB provide a listing (in paper copy or by e-mail) of citations to newly acquired accessions in the TR database that match a user's subject profile. The Automatic Document Distribution (ADD) or Automatic Hardcopy Document Distribution (AHDD) programs provide services to get entire documents in microfiche and/or hard copy. The CAB and ECAD are updated twice a month. The CAB/ECAB's Internet address is [http://www.dtic.mil/dtic/cab.html].

- **Current Research Summaries.** Current research summaries provide WUIS and IR&D records that match a user's subject interest profile(s) on a recurring basis. These summaries can be produced on a monthly, quarterly, semiannual, or annual schedule.

Access to Compact Disc/Read-Only Memory (CD/ROM) Products

DTIC's compact disc/read-only memory (CD/ROM) products include:

- **Technical Reports (TR) Database Bibliographies on Compact Disc (CD).** This CD-ROM is a subscription product that contains citations to over 1.3 million documents in DTIC's TR database, including information on technical reports, DoD Directives and Instructions, regulatory publications, patent applications, conference papers, data files, databases, software, and videos. These CD-ROMs are updated quarterly. The Internet address for information on this product is [http://www.dtic.mil/dtic/trcdrom.html].

- **Internal Research and Development (IR&D) on Compact Disc (CD).** This CD-ROM is a subscription product that contains over 4,000 IR&D projects initiated by industry but not under DoD contract. Information, which includes objectives, approaches, progress, diagrams, and photos, is considered proprietary and is available only to DoD and DoD-approved organizations. This CD-ROM is updated twice a year. The Internet address for information on this product is [http://www.dtic.mil/dtic/irdcdrom.html].

Access to On-Line Services

The DTIC on-line services access includes:

- **The Defense RDT&E On-line System (DROLS).** DROLS is an on-line interactive system that provides direct access to classified/limited-access information and unclassified information in DTIC's three major databases: TR Bibliographic, the WUIS, and the IR&D. It is currently the only database that satisfies the DoD regulatory requirements to ensure no duplication of R&D or other S&T efforts. **Note:** *DROLS requires formal training in the native DROLS language. Searches are generally performed with the help of personnel who use this system on a regular basis.* DROLS' Internet address is [http://www.dtic.mil/dtic/drols.html].

- **Technical Reports Graphical User Interface (TRGUI).** The TRGUI provides an easy-to-use tool to access, search, and order information from the DROLS TR Bibliographic database using a windows point and click interface. No training is required. DTIC expects to have the R&T WUIS database included by the end of calendar year (CY) 1997. The TRUGI is compatible with the Secure Telephone Unit (STU III) Asynchronous only. TGRUI's Internet address is [http://www.dtic.mil/dtic/trgui.html].

- **GoldenGate.** GoldenGate is a graphical user interface (GUI) for searching the DTIC TR Bibliographic and WUIS databases and over 200 government and commercial STI databases, including DROLS. GoldenGate provides a

single point-of-access to these databases and helps users formulate effective queries for searching. GoldenGate also provides access to commercial vendors (i.e., DIALOG, OVID, and Legi-Slate) and their S&T information; however, separate arrangements must be made with these commercial vendors to use their services.

Access to Internet Services

The DTIC Internet services access includes:

- **The Defense Technical Information Center (DTIC) Homepage.** The DTIC Internet Homepage provides an in-depth look at the DTIC organization, processes, products, and services. The DTIC Internet address is [http://www.dtic.mil].

- The Defense Technical Information Web (DTIW). DTIC operates the DTIW, a World Wide Web site for finding information on, and of interest to, DoD. The DTIW Internet address is [http://www.dtic.mil/dtiw]. DTIW allows access to the following DTIC-managed STI information and databases.

    - The Scientific and Technical Information Network (STINET). Two versions of the STINET Service reside on the Internet: Public STINET and Secure STINET (S-STINET). STINET's Internet address is [http://www.dtic.mil/stinet].

        - - *Public STINET.* Public STINET (703-767-8272) includes access to over 11 years of the unclassified, unlimited portion of DTIC's TR Bibliographic database; the R&D descriptive summaries, the DoD index to specifications and standards, reference information (i.e., directories), SBIR solicitations, and a limited selection of full-text electronic technical reports. Public STINET provides the DoD community with a window to mission-critical STI information, including DoD R&D, gray literature (restricted to .mil and .gov sites), and research by others. It also provides information on policy and budget documents and up-to-date information news feeds.

        - - Secure STINET (S-STINET). S-STINET is a subscription product that contains the information in the "Public version" but is password controlled. In addition, .mil Internet sites will be able to view sites limited to "DoD access only." Access to S-STINET is limited to government agencies and their contractors.

            S-STINET provides access to, and has document ordering capability for citations (excluding abstracts) to unclassified/limited documents for the last 11 years; the last 5 years of unclassified active full-text

Work Unit Summaries; simultaneous searching of DoD, Department of Energy (DOE) and National Aeronautics and Space Administration (NASA) databases using the same query; and First News Service, which provides information from a worldwide network of databases, news wires, newspapers, trade publications, and magazines on many diverse topics.

- DefenseLINK. DefenseLINK provides a starting point to access information on DoD—its organizations, and its functions. It also provides direct access to the information services that have been established by each military department and organization. For DoD information, DefenseLINK's Internet address is [http://www.defenselink.mil/pubs/ofg.html].

DTIC does not provide services to the general public and requires registration from those eligible to receive it services. It maintains a central registry file of users authorized to access defense-related information. All requests are validated against the central register for status, site classification, and/or subject matter need-to-know. Eligible users include DoD components; military Services; other U.S. government agencies and their contractors; DoD military and civilian students; universities involved in federally funded research throughout the United States; small business participants involved in Small Business Innovative Research (SBIR); and potential contractors. DTIC provides access to unclassified/ unlimited-access technical reports and bibliographic information through the National Technical Information Service (NTIS) (703-487-4660).

The Product Management Branch (703-767-8267) is DTIC's point of contact (POC). To register to use the DTIC system, phone 703-767-8273 or 1-800-225-3842. The e-mail address is [reghelp@dtic.mil]. DTIC's Internet address is [http://www. dtic.mil].

Access to Joint Internet Resources

Several sites provide an extensive listing of information resources that DTIC has produced for other organizations and DTIC research, development, and acquisition resources. The Internet address for DTIC's Joint-Produced Internet Resources is [http://www.dtic.mil/dtic/joint-inet.html]

Some sites of interest for S&T-related information are the following:

- **Aerospace Guidance and Metrology Center (AGMC).** AGMC is a key facility within the Air Force Materiel Command (AFMC). It plays a vital role in maintaining the operational readiness of the Air Force's first-line aircraft

and missiles. The Internet address is [http://www.dtic.mil/ozone/fulltext.html].

- **Aerospace in the 21st Century Electronic Bibliography.** This site explores the field of Aerospace and the advanced developments, research, and technologies that are expected 20 to 50 years in the future. This information has been compiled for the North Atlantic Treaty Organization (NATO) Advisory Group for Aerospace Research and Development (AGARD). The Internet address is [http://www/dtic.mil.aerospace].

- **AirForceLINK.** AirForceLINK is the official Department of the Air Force Homepage and the starting point for locating information about the Department of the Air Force, its organization, and its functions. The Internet address is [http://www.af.mil].

- **ArmyLINK.** This site for Army Public Affairs carries out that organization's mission to inform and help establish the conditions that lead to confidence in America's Army and its readiness to conduct operations in peacetime, conflict, and war. The Internet address is [http://www.dtic.mil/armylink].

- **Army Materiel Command (AMC).** AMC supports the strategic forces with the technology, equipment, and logistics essential for success on any battlefield. It also handles diverse tasks (i.e., acquiring ammunitions for all the U.S. military services, managing the sale of Army equipment and services, and negotiating and implementing agreements for co-production of U.S. weapons systems by foreign nations). The Internet address is [http://www.amc.army.mil].

- **CENDI.** CENDI is an inter-agency[1] cooperative organization composed of STI managers to improve federal STI support systems. The Internet address is [http://www.dtic.mil/cendi].

- **Director of Defense Research and Engineering (DDR&E).** DDR&E is the chief technical advisor to the Secretary of Defense and the Under Secretary of Defense for Acquisition and Technology (USD (A&T)) on defense S&T development, priorities, programs and strategies. This site includes articles and papers, briefings and speeches, plans and documents,

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[1] CENDI = Department of Commerce/National Technical Information Service; Department of Education/National Library of Education; Department of Energy/Office of Scientific and Technical Information; **National** Aeronautics and Space Administration/Science and Technical Information Program; **National** Library of Medicine; the Department of **Defense**/Defense Technical Information Center and National Air Intelligence Center; and the Department of the **Interior**/USGS/Biological Resources Division

testimonies, a calendar of events, S&T programs, and much more. The Internet address is [http://www.dtic.mil/ddre].

- **DDDR&E Laboratory Management and Technology Transition (LM&TT).** This site introduces the Office of the Deputy Director of Defense Research and Engineering for Laboratory Management and Technology Transition. It provides a variety of management-related information and describes ongoing projects of interest to DoD laboratories. It also provides easy access to reports and projects generated by this office. The Internet address is [http://www.dtic.mil/labman].

- **DefenseLINK.** DefenseLINK provides the highest level entry into the official information resources made available on the Web by various components of the DoD. In addition, the DefenseLINK Locator provides search access to the database of DoD Government Information Locator Service (GILS) records. The Internet address is [http://www.defenselink.mil].

- **DefenseLINK Locator (DoD-GILS).** DoD-GILS is a searchable component to help the public locate and access DoD information resources. It describes the information available in those resources and provides assistance in obtaining the information. The Internet address is [http://www. defenselink.mil/locator].

- **Defense S&T Planning.** This site provides a single location for the basic S&T planning and selected related DoD documents. It includes the Defense Science and Technology Strategy, the Basic Research Plan, the Defense Technology Objective, the Defense Technology Area Plan, the Joint Warfighting Science and Technology Plan, and selected Service and Defense Agency planning documents. The Internet address is [http://www. dtic.mil/dstp].

- **DoD Directives and Instructions.** The Director of Administration and Management Homepage contains a large number of the directives and instructions issued by the DoD. The Internet address is [http://www. web7.whs.osd.mil/corres.htm].

- **DoD Militarily Critical Technologies List (MCTL).** The MCTL is a detailed and structured compendium of the technologies that DoD assesses as critical to maintaining superior United States military capabilities. The Internet address is [http://www.dtic.mil/mctl].

- **International Aerospace Information Network (IAIN).** The IAIN Homepage is a prototype developed by the NATO AGARD. It is designed to guide the user to aerospace and aerospace-related sources of information. This site identifies and provides access to major collections of data relevant to aerospace R&D and serves as a vehicle to stimulate the integration and access

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of multidisciplinary data related to aerospace R&D. The Internet address is [http://www.dtic.mil/iain].

- **International Council for Scientific and Technical Information (ICSTI).** ICSTI offers a unique forum for interaction between organizations that create, disseminate, and use S&T information. The Internet address is [http://www.cisti.nrc.ca/icsti].

- **Joint Chiefs of Staff (JCS).** This site consists of information about the Joint Staff organization. The Internet address is [http://www.dtic.mil/jcs].

- **LabLINK.** LabLINK provides a single access point to the DoD laboratory activities and presents a spectrum of government, academic, non-profit and private industry information sources on S&T research and policy. The Internet address is [http://www.dtic.mil/lablink].

- **MarineLINK.** MarineLink is the official web site of the U.S. Marine Corps. It provides recruitment information, press releases, fact sheets on weapons and equipment systems, and other pertinent U.S. Marine Corps information. The Internet address is [http://www.usmc.mil].

- **North American Technology and Industrial Base Organization (NATIBO).** NATIBO's primary purpose is to identify and analyze key industrial sectors that are critical to defense, assess the viability of these sectors, identify issues and barriers related to sector viability, and develop strategies to enhance and sustain the health of the marketplace. The Internet address is [http://www.dtic.mil/natibo].

- **Technology Navigator.** The Technology Navigator is a DTIC-sponsored effort using the Internet and government's intranets. This site allows users to explore emerging technologies and share information with experts from government, industry, and academia. The Internet address is [http://www.dtic.mil/technav].

- **TechTRANSIT.** DDR&E's TechTRANSIT connects technology transfer resources and activities to meet the requirements of the DoD Office of Technology Transition. This office promotes technology transfer activities (i.e., spin-on technology opportunities, spin-off transfer to the private sector, and defense conversion with dual-use applications). This site provides links to the technology transfer activities of federal, state, and international organizations. The Internet address is [http://www.dtic.mil/techtransit].

DEPARTMENT OF DEFENSE (DoD) INFORMATION AND ANALYSIS CENTERS (IACs)

IACs are formal organizations sponsored by DoD to facilitate the use of highly specialized STI of concern to DoD. They establish and maintain comprehensive knowledge bases and databases, which include historical, technical, scientific and other data and information collected on a worldwide basis. Information collections include a wide range of unclassified, limited distribution, and classified information appropriate to the sponsoring technical communities. The collections are continually updated to incorporate the latest research information. Scientists, engineers, and information specialists staff the IACs.

Most IAC services are free or have a minimal service charge that sponsoring agencies impose to cover the costs of preparing materials or responses. The DTIC IAC POC can be reached at 703-767-9120. The IAC e-mail address is [iac@dtic.mil]. The IAC's Internet address is [http://www.dtic.mil/iac/#home]. The IAC centers and their Internet addresses are:

- **Advanced Materials and Process Technology Information Analysis Center (AMPTIAC).** AMPTIAC's Internet address is [http://www.rome.iitri.com/amptiac].

- **Chemical Warfare/Chemical and Biological Defense Information Analysis Center (CBIAC).** CBIAC's Internet address is [http://www.cbiac.apgea.army.mil].

- **Chemical Propulsion Information Agency (CPIA).** CPIA's Internet address is [http://www.jhu.edu/~cpia].

- **Cold Regions Science and Technology Information Analysis Center (CRSTIAC).** CRSTIAC's Internet address is [http://www.crrel.usace.army.mil/crstiac/crstiac.html].

- **Crew System Ergonomics Information Analysis Center (CSERIAC).** CSERIAC's Internet address is [http://cseriac.flight.wpafb.af.mil].

- **Data and Analysis Center for Software (DACS).** DACS's Internet address is [http://www.dacs.dtic.mil].

- **Defense Modeling, Simulation, and Tactical Technology Information Analysis Center (DMSTTIAC).** DMSTTIAC's Internet address is [http://dmsttiac.hq.iitri.com].

- **Guidance and Control Information Analysis Center (GACIAC).** GACIAC's Internet address is [http://gaciac.iitri.com].

- **Information Assurance Technology Analysis Center (IATAC).** IATAC's Internet address is [http://www.iatac.dtic.mil/iatac.htm].

- **Infrared Information Analysis Center (IRIA).** IRIA's Internet address is [http://www.erim.org/IRIA/ iria.html].

- **Manufacturing Technology Information Analysis Center (MTIAC).** MTIAC's Internet address is [http://www.mtiac.iitri.com].

- **Nondestructive Testing Information Analysis Center (NTIAC).** NTIAC's Internet address is [http://www.ntiac.com].

- **Reliability Analysis Center (RAC).** RAC's Internet address is [http://www.rome.iitri.com/rac].

- **Survivability/Vulnerability Information Analysis Center (SURVIAC).** SURVIAC's Internet address is [http://surviac.flight.wpafb. af.mil].

Table 1 gives the reader a "quick-look" view of the DTIC database accessibility and availability.

Table 1. DTIC Database Accessibility and Availability

Features	DROLS [1] (On-Line Access)	TR GUI (DROLS Asynchronous Users Only)	DGIS [2] (On-Line Access)	Public STINET (Internet Access)	Secure STINET (Internet Access)	GoldenGate (Internet Access)	TR Database on CD-ROM	IR&D Database on CD-ROM (DoD Only)
Coverage of DTIC's Databases	• TR Bibliographic • WUIS • IR&D	• TR Bibliographic • WUIS	• TR Bibliographic (accessible through Public STINET)	• TR Bibliographic	• TR Bibliographic. No abstracts • WUIS [active records (5 years)]	• TR Bibliographic • WUIS	• TR Bibliographic (no IAC citations)	• IR&D
Classification Level	Unclassified and classified citations to documents up to the Secret level (dependent upon user authorization)	Unclassified and classified citations to documents up to the Secret level (dependent upon user authorization)	Citations to unclassified/unlimited documents	Citations to unclassified/unlimited documents	Citations to unclassified/limited technical reports and WUIS active records (dependent upon user authorization)	Unclassified citations up to Secret level (dependent upon user authorization)	Unclassified citations to documents up to Secret level (authorization required for access to export-controlled data)	Unclassified; company proprietary data (access limited to DoD and NASA only)
Number of Records	Over 2.1 million	Over 2 million	Nearly 350,000	Nearly 350,000	Over 450,000	Over 2 million	Over 1.3 million	Over 3800+ records [3]
Years Covered	All years (as far back as World War I)	All years (as far back as World War I)	Last 11 years	Last 11 years	Last 11 years (TR); last 5 years (WUIS)	All years (as far back as World War I)	All years (as far back as World War I)	1993–present (one year per CD-ROM)
Training Courses (Free)	In-house or on-site (3 days)	Not required; DROLS training can be helpful for effective use	Not required	Not required	Not required	Not required	Not required	Not required

Table 1. DTIC Database Accessibility and Availability (Continued)

Features	DROLS (On-Line Access)	TR GUI (DROLS Asynchronous Users Only)	DGIS (On-Line Access)	Public STINET (Internet Access)	Secure STINET (Internet Access)	GoldenGate (Internet Access)	TR Database on CD-ROM	IR&D Database on CD-ROM (DoD Only)
Searching Capabilities	• Boolean logic • Native DROLS language	• Boolean logic • Windows environment	• Boolean logic • WAIS	• Boolean logic • WAIS	• Boolean logic • WAIS	• Boolean logic • Windows environment • Native DROLS language or Common Command Language	• Boolean logic • Mnemonics	• Boolean logic • Windows environment • Natural language
Minimum Experience Required	Intermediate (requires training)	Novice	Novice	Novice	Novice	Novice	Novice	Novice
Ordering Capabilities	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Costs	• $125/year • $40/per connect hour	• GUI software free with DROLS registration • $125/year, plus $40/per connect hour charges	• $100 per year/ per subscription • Includes Public STINET • No connect hour charge	• Free	• $50 per year/per subscriber	• $50 per subscriber[4] • Group rate: $50 for first, $20 each additional subscriber • $20 per subscriber each additional year	• $600 for four quarterly issues	• $50 for requesters outside the military Services and NASA

Table 1. DTIC Database Accessibility and Availability (Continued)

Features	DROLS (On-Line Access)	TR GUI (DROLS Asynchronous Users Only)	DGIS (On-Line Access)	Public STINET (Internet Access)	Secure STINET (Internet Access)	GoldenGate (Internet Access)	TR Database on CD-ROM	IR&D Database on CD-ROM (DoD Only)
Other Attributes	• Satisfies regulatory requirements for searching DTIC's databases • 0530–2130 M, T, Th, F • (Wed.: 0730–2130)	• 0530–2130 M, T, Th, F • (Wed.: 0730–2130) • WUIS GUI under development	• Available 24 hrs/day • Internet access includes e-mail • Internet access is character based	• Available 24 hrs/day • Directories to DoD sources • Limited selection of full-text electronic reports	• Available 24 hrs/day • Directories to DoD sources • Limited selection of full-text electronic reports • News services	• Gateway to government and commercial databases • TR and WUIS databases available • 0530–2130 M, T, Th, F • (Wed.: 0730–2130)	• Updated quarterly	• Updated semiannually

Note 1 for Table 1: *Must be used before start of a new RDT&E program*

Note 2 for Table 1: *Using Lynx (character based)*

Note 3 for Table 1: *Projects, overviews, and financial summaries*

Note 4 for Table 1: *Separate DROLS registration required*

V. DEPARTMENT OF HEALTH AND
HUMAN SERVICES (HHS)

HHS is the federal government's principal agency for protecting the health of all Americans and providing essential human services. HHS directs more than 300 programs that cover a wide spectrum of activities, including:

- Medical and social science research

- Preventing the outbreak of infectious disease

- Ensuring food and drug safety

- Providing information on health issues, medical research and advances, treatment of diseases

- Compiling registries on toxic and hazardous substances

- Medicare and Medicaid

- Social service programs for the less fortunate.

The medical and social science research, preventing infectious disease, and ensuring food and drug safety are critical programs during peacetime and during times of crisis, especially during combat operations when deployed troops must be provided adequate supplies of safe and reliable rations, drugs and medical supplies, vaccines, and biological and chemical defense items. Military program offices, the Services Surgeon General and Services/Defense Agency procurement offices work closely with HHS representatives in developing new drugs, vaccines, and antidotes; maintaining reliable sources of supplies for medical items and food/operational rations; and finding suitable alternatives in emergency or short supply situations.

HHS is the largest grant-making agency in the federal government. It provides over 60,000 grants per year. The HHS budget for research and development (R&D) is $13 billion per year (FY 1998) and is the second largest behind the Department of Defense (DoD). HHS spends more than DoD in basic and applied research, including some science and technology (S&T) efforts that are critical to the military Services. HHS programs are administered by the HHS Operating Divisions. All the Operating Divisions can be accessed from the HHS Internet Homepage [http://www.hhs.gov].

KEY SOURCES FOR RESEARCH AND DATA

HHS is making an increasing amount of its S&T information available on-line and accessible on the Internet. Some of the HHS research, data, and policy information can be accessed only through specialized databases, and many HHS Internet sites have their own search engines. HHS has simplified access to these specialized information sources by collecting them in a single web page. The HHS Internet address is [http://www.hhs.gov].

THE DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS) DATA COUNCIL

The HHS Data Council coordinates HHS collection and analysis activities through an integrated health data collection strategy. It meets monthly to coordinate all department health and non-health data collection and analysis activities. Issue-specific, inter-agency standing, and ad hoc staff committees perform the bulk of the council's work.

BIOMEDICAL RESEARCH

The National Institutes of Health (NIH)

NIH's mission is to uncover new knowledge that will lead to better health for everyone. NIH accounts for over 90 percent of the research spending within HHS. It works toward that mission by:

- Conducting research in its own laboratories

- Supporting research of non-federal scientists in universities, medical schools, hospitals, and research institutions throughout the country and abroad

- Helping to train research investigators

- Fostering communications of biomedical research.

NIH is one of eight health agencies within HHS and comprises 24 separate institutes, centers and divisions. More than 81 percent of NIH's S&T investments are made through grants and contracts supporting research and training in more than 1,700 research institutions. These grants and contracts comprise the NIH Extramural Research Program. Approximately 11 percent of the budget goes to NIH-conducted research programs (Intramural Research Programs). Specific information on each activity can be accessed through the NIH Internet Homepage. NIH's Internet address is [http://www.nih.gov].

KEY SOURCES OF SCIENCE AND TECHNOLOGY (S&T) INFORMATION

Key sources of S&T Information at HHS are the NLM and the National Center for Research Resources (NCRR).

The National Library of Medicine (NLM)

The NLM is the world's largest medical library. It collects materials in all major areas of the health sciences and, to a lesser degree, other areas (i.e., chemistry, physics, botany, and zoology). The collection stands at 5 million items and includes books, journals, technical reports, manuscripts, microfilms, photographs, and images.

The NLM also functions as a national resource for all U.S. health science libraries through a National Network of Libraries of Medicine (NN/LM). The NN/LM consists of 4,500 primary access libraries (mainly hospitals) and 140 resource libraries (mostly medical schools). These libraries cover all geographic regions of the United States.

Several computer-based analysis and retrieval and on-line access systems provide access to the NLM databases. The NLM Internet Homepage affords access to a complete list of NLM on-line databases. NLM's Internet address is [http://www.nlm.nih.gov].

Key resources at the NLM are:

- **Medical Literature Analysis and Retrieval System (MEDLARS).** MEDLARS is a computer-based system for storing and retrieving bibliographic and factual information and published/printed products [i.e., *Index Medicus* (a monthly listing of references, published in 36 languages) to current articles from over 3,200 of the world's biomedical journals]. It currently contains over 8.6 million references that date back to 1966. MEDLARS now represents a family of over 40 databases, of which MEDlars onLine (MEDLINE) is the most well known. The Internet address for MEDLARS is [http://www.nlm.nih.gov/databases/medlars.html].

- **MEDLINE.** MEDLINE is the NLM's premier bibliographic database. It covers the fields of medicine, nursing, dentistry, veterinary medicine, the health care system, and the preclinical sciences. MEDLINE enables individuals and organizations to query the NLM computer's store of journal articles and other references on specific subjects. MEDLINE is updated weekly, and approximately 33,000 new citations are added each month. MEDLINE can be accessed using command direct language searching, commercial networks, and through the Internet using user friendly software

interface program called Grateful Med. The Internet address for MEDLINE is [http://www.nlm.nih.gov/databases/medline.html].

- *Internet Grateful Med (IGM).* The NLM developed the software interface called Grateful Med in 1986 to make searching user friendly and to improve the efficiency of searching for specific topics. IGM allows access to MEDLINE (1966 to the present). In addition to MEDLINE, HealthSTAR, PREMEDLINE, and AIDSLINE, IGM offers free access to AIDSDRUGS, AIDSTRIALS, DIRLINE, HISTLINE, HSRPROJ, OLDMEDLINE, and SDILINE. IGM's Internet address is [http://igm.nlm.nih.gov].

- **The NIH Bibliographic Services Division.** This division provides access to biomedical bibliographic information by maintaining the MEDLARS system and the MEDLINE database and by creating computer-produced bibliographic publications and *Index Medicus.* The division has two sections:

  - *The Index Section.* The Index Section creates *Index Medicus* and maintains the MEDLINE database.

  - *The MEDLARS Management Section (MMS).* MMS is responsible for computer-produced bibliographic publications, data licensing and distribution, and training on-line users. MMS can be contacted at 1-888-346-3656. It also responds to questions via e-mail: Grateful Med questions at [gmhelp@nlm.nih.gov] and MEDLARS at [mms@nlm.nih.gov].

- **The Division of Specialized Information Services (SIS).** The SIS Division provides on-line services, responds to queries, sponsors publications, supports information requirements of other federal agencies, and supports interactive retrieval services in toxicology, environmental health, and other health-related areas. The SIS Division is responsible for creating and maintaining TOXNET, an integrated system for building, reviewing, and searching toxicology and environmental health-related databases. The SIS Division can be reached at 301-496-1131. The SIS Division's Internet address is [http://www.sis.nlm.nih.gov].

- **The Lister National Center for Biomedical Communications (LHNCBC).** LHNCBC conducts active R&D for the broad purpose of improving health-care information dissemination and use. This involves a wide range of research activities and disciplines. Research staff are engaged in developing intelligent information storage and retrieval systems, conducting their research by drawing on a diverse set of scientific fields and methods. Current staff have backgrounds in medicine, computer science, library and information science, linguistics, cognitive science, education, and engineering.

Research projects include digital library research, automated indexing techniques, vocabulary and thesaurus research, natural language processing, medical knowledge representation, image processing, database design, machine learning, expert systems, and computer-based learning. The Unified Medical Language System knowledge sources, the Visible Human data set, and MEDLINE data are important sources of knowledge for many of LHNCBC's experiments LHNBC's Internet address is [http://www.lhncbc. nlm.nih.gov].

The National Center for Research Resources (NCRR)

The NCRR serves as a "catalyst for discovery" by creating and providing critical research technologies and by providing cost-effective, multidisciplinary, and shared resources across the full spectrum of NIH-supported research activities. The NCRR plays a key role in addressing NIH research issues (i.e., gaining access to the state-of-the-art instrumentation and biomedical technologies). The NCRR Internet Homepage provides access to the NCRR strategic plan and research resources. The NCCR's Internet address is [http://www.ncrr.nih.gov].

SOURCES OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS) SCIENCE AND TECHNOLOGY (S&T) INFORMATION FOR THE DEPARTMENT OF DEFENSE (DoD)

Food and Drug Administration (FDA)

The FDA is a consumer protection agency. It is responsible for ensuring that food is safe to eat and that medicines and medical devices are safe and effective to use. It monitors the manufacture, import, transport, storage, and sale of foods, medicines, medical devices, cosmetics, radiation emitting devices, and animal food and drugs. It plays a critical role for DoD in developing and manufacturing new drugs, vaccines, biological and chemical defense items, operational rations, and other medical devices. The FDA also assists DoD in obtaining suitable off-shore medical items during emergency situations.

The FDA operates the National Center for Toxicological Research (NCTR), which investigates the biological effects of widely used chemicals. It also operates the Engineering and Analytical Center (EAC), which tests medical devices, radiation emitting products, and radioactive drugs.

The FDA does not conduct research; rather, it examines the results of new studies by manufacturers and assesses their production, vendors, storage, testing, and distribution

to ensure safe, quality, and consistent performance products. The FDA Internet Homepage provides access to complete information on the FDA. The FDA's Internet address is [http://www.fda.gov].

Centers for Disease Control and Prevention (CDC)

The CDC promote health and quality of life by preventing and controlling disease, injury, and disability. The CDC comprise 11 centers, institutes, and offices whose mission is to monitor the nation's health, detect and investigate health problems, conduct research to enhance disease prevention, guard against international disease transmission, provide immunization services, and implement prevention strategies. The CDC play an important medical role for DoD in ensuring the availability of vaccines, maintaining health/death statistics, detecting and monitoring diseases, and administrating research and operational programs for the prevention and control of vaccine-preventable diseases worldwide. The CDC's Internet address is [http://www.cdc.gov].

Several key CDC organizations of interest to DoD are:

- **National Center for Infectious Disease (NCID).** The NCID is responsible for conducting surveillance, epidemic investigations, epidemiological and laboratory research, and training and education programs to control infectious disease. The NCID administers the Division of Vector-Borne Infectious Diseases (DVBID) and serves as a national and international reference center for vector-borne and bacterial disease (i.e., Lyme disease, the plague, yellow fever, encephalitis) and other diseases that are a health threat to deployed troops. The NCID's Internet address is [http://www.cdc.gov/ncidod].

- **National Center for Health Statistics (NCHS).** NCHS's mission is to provide statistical information that will guide actions and policies to improve the health of the American people. The NCHS maintains an on-line public information system that can provide statistics on many public health issues, diseases, and causes of deaths. The NCHS's Internet address is [http://www.cdc.gov/nchswww/products/products.htm].

- **Agency for Toxic Substances and Disease Registry (ATSDR) Hazardous Substances Release/Health Effects Database.** The ATSDR database is the scientific and administrative database developed to provide access to information on the release of hazardous substances from Superfund sites or emergency events and on the effects of hazardous substances on the health of human populations. The database can be accessed at the Internet site [http://atsdr1.atsdr.cdc.gov:8080/atsdrhome.html].

OTHER USEFUL DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS) SITES

Office of Emergency Preparedness (OEP)

The OEP's mission is to manage and coordinate federal health, medical, and health-related social service response and recovery to federally declared disasters under the Federal Response Plan. This would include acts of terrorism, plans for continuity of operations, and health and medical consequences of nuclear, biological and chemical attack. The OEP's Internet address is [http://www.hhs.gov/progorg/ophs/oep.htm].

Agency for Health Care Policy and Research (AHCPR)

AHCPR is the lead agency charged with supporting research designed to improve the quality of health care, reduce its cost, and broaden access to essential services. The AHCPR's Internet address is [http://www.ahcpr.gov].

VI. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

The National Aeronautics and Space Administration (NASA) was established by the Space Act of 1958. It is the federal civilian agency responsible for exercising controls over aeronautical and space activities sponsored by the United States. NASA origins date back to 1915 when Congress created National Advisory Committee for Aeronautics, which would "supervise and direct the scientific study of the problems of flight, with a view to their practical solutions." That organization evolved into NASA in 1958 when Congress formed a civilian agency to lead "the expansion of human knowledge in the atmosphere and space."

NASA's science and technology (S&T) mission is to research, develop, verify, and transfer advanced aeronautics, space, and related technologies; advance and communicate scientific knowledge and understanding of the Earth, the solar system, and the universe; and use the environment of space for human enterprise. Many of these efforts support or are conducted jointly with other federal agencies. Most of NASA's S&T efforts have some bearing on Department of Defense (DoD) technology needs. For example, virtually every aircraft in use today uses technology pioneered by NASA. Space exploration has contributed significantly to advanced medical equipment, communications satellites, weather forecasting, and natural resource mapping. NASA's research and development (R&D) budget authority for FY 1998 is $9.277 billion and ranks third in all federal agencies, accounting for over 12 percent of all federal S&T spending.

NASA's Internet address is [http://www.nasa.gov].

THE STRATEGIC ENTERPRISES

NASA executes its mission through four strategic enterprises. Each enterprise is analogous to a strategic business unit that commercial companies use to focus on and respond to their customer needs. Each enterprise has a set of strategic goals, objectives, and strategies that address the requirements of their core mission areas. In each enterprise area, the efforts in basic and applied science, R&D, and the equipment fielded have a direct bearing on the DoD S&T programs.

Aeronautics Enterprise

The goal of the Office of Aeronautics and Space Transportation Technology (OASTT), also known as the Aeronautics Enterprise, goal is to conduct long-range, high-risk, high-payoff research and technology (R&T) development to afford the U.S. superior civilian and military aircraft and space launch systems. NASA works closely with industry, academia, DoD, and the Federal Aviation Administration (FAA) to ensure that the national investments in aeronautics and space transportation R&D are clearly defined and coordinated. The program addresses critical aeronautical needs for improvements in safety, environment, aerospace productivity and aircraft performance, develops and demonstrates precompetitive next-generation space launch technology, and transfers NASA-developed technology to U.S. industry to ensure the U.S. leadership in aviation technology. OASTT's Internet address is [http://www.hq.nasa.gov/office/aero].

Human Exploration and Development of Space Enterprise (HEDS)

A critical goal of this enterprise is to develop new products and manufacturing processes in a gravity free environment. HEDS' Internet address is [http://www.osf.hq.nasa.gov/heds].

Earth Science Enterprise (ESE)

This enterprise is dedicated to understanding the total Earth system and the effects of natural and human-induced changes on the global environment. ESE's Internet address is [http://www.hq.nasa.gov/office/mtpe].

Space Science Enterprise (SSE)

This enterprise is dedicated to the exploration of space. The goals of the SSE S&T programs are to develop increasingly capable telescopes, scanning the entire electromagnetic spectrum from gamma rays to radio waves, and probing interstellar space beyond our solar system. SSE's Internet address is [http://www.hq.nasa.gov/office/oss/osshome.htm].

FIELD CENTERS

NASA accomplishes its mission and goals through its nine field centers and the contractor-operated Jet Propulsion Laboratory (JPL), each with established areas of excellence and specific missions.

- **Ames Research Center (ARC).** The ARC, located at Moffet Field, California, is the Center of Excellence for Information Technology. Its mission is airspace operations systems and astrobiology. It conducts computer science and information system development and space, Earth, and life sciences research. Activities include flight simulation, wind tunnel development and operation, supercomputing and advanced computer-based modeling, and origins of life in the universe studies. ARC's Internet address is [http://www.arc.nasa.gov].

- **Dryden Flight Research Center (DFRC).** The DRFC, collocated at Edwards Air Force Base, California, is the Center of Excellence for Atmospheric Flight Operations. Its mission is flight research, and it provides a facility for space shuttle landings and tests on a variety of aerospace vehicles. It also supports high-performance aircraft and spacecraft, general aviation, and flight research through and above the atmosphere. DFRC's Internet address is [http://www.dfrc.nasa.gov/dryden.html].

- **Goddard Space Flight Center (GSFC).** GSFC, located in Greenbelt, Maryland, is the Center of Excellence for Scientific Research. Its mission is Earth science/physics and astronomy. It conducts research in Earth science and astrophysics and satellite tracking and control. It directs the development of the Earth Observing System (EOS); manages and operates the Hubbell Space Telescope; and operates the Tracking and Data Relay Satellite System (TDRSS), NASA's primary satellite communications network; and operates most Earth-orbiting robotics spacecraft. GFCS's Internet address is [http://www.gsfc.nasa.gov].

- **Lyndon B. Johnson Space Center (JSC).** JSC, located in Houston, Texas, is the Center of Excellence for Human Operations in Space. Its mission is human exploration and astromaterials. It manages the Space Shuttle and International Space Station programs. Major activities include Shuttle mission control and operations planning, selection and training of astronauts, applied medical and life sciences research, and studies of lunar samples from the Apollo program. JCS's Internet address is [http://www.jsc.nasa.gov].

- **John F. Kennedy Space Center (KSC).** KSC, located in Cape Canaveral, Florida, is the Center of Excellence for Space Launch. It launches the Space Shuttle and expendable rockets; prepares shuttles for launch and services them upon return; develops and maintains launch pads; provides the primary landing site for the shuttle; and will operate the Space Station Processing Facility. KSC's Internet address is [http://www.ksc.nasa.gov/ksc.html].

- **Langley Research Center (LaRC).** LaRC, adjacent to the Langley AFB near Hampton, Virginia, is the Center of Excellence for Structures and Materials. Its mission is airframe systems, aerodynamics, and atmospheric science. It performs R&D in aeronautics and space technology related to aircraft safety, aerodynamics, general aviation, hypersonic flight, space systems and documentation, advanced composite materials and their non-destructive testing, and vertical/short-takeoff and landing flight research. LaRC's Internet address is [http://www.larc.nasa.gov].

- **Lewis Research Center (LeRC).** LeRC occupies two sites: the main site in Cleveland, Ohio, adjacent to Cleveland-Hopkins Airport and the second site at Plum Brook Station near Sandusky, Ohio. It is the Center of Excellence for Turbomachinery. Its mission is aeropropulsion. It is the international leader in jet engine research. It conducts research in advanced space propulsion and space power systems, including electrical power solar arrays, combustion research, aircraft engine noise and emissions reduction, chemical and electrical rocket propulsion, and advanced turbojet aircraft engines. LeRC's Internet address is [http://www.lerc.nasa.gov].

- **George C. Marshall Space Flight Center (MSFC).** MSFC, located within the Redstone Arsenal at Huntsville, Alabama, is the Center of Excellence for Space Propulsion. Its mission is transportation systems development and microgravity. It provides expertise for rocket engine development and has R&D responsibilities in the Space Station program, astrophysics, microgravity science, and technology transfer. It also manages the main rocket engines, external fuel tank, and solid fuel boosters for the Space Shuttle program and its space lab microgravity science modules; develops the pressurized living and working modules; manages the development of the Advanced X-Ray Astrophysics Facility astronomy satellite; and develops new generations of reusable launch vehicles. MSFC's Internet address is [http://www.msfc.nasa.gov].

- **John C. Stennis Space Center (SSC).** SSC, located at Bay St. Louis, Mississippi, is the Center of Excellence for Propulsion Test. It is the premier center for testing large rocket propulsion systems, and it maintains and operates a range of jet engine testing stands/facilities. It fosters the development of the commercialization of Earth observation data and provides expertise in land-use planning and other applications of Earth remote sensing data. SSC's Internet address is [http://www.ssc.nasa.gov].

- **Jet Propulsion Laboratory (JPL).** JPL, a government-owned, contractor-operated facility located in Pasadena, California, is the Center of Excellence for Deep Space Systems. Its mission is planetary science and exploration. It also has expertise in planetary science and manages/operates

the worldwide Deep Space Network (DSN) of large ground-based satellite communications dishes. It designs and operates spacecraft to explore the solar systems, supports research in automated spacecraft operations and related computer science, and develops advanced technology in spacecraft and science instrument miniaturization. JPL's Internet address is [http://www.jpl. nasa.gov].

ON-LINE RESOURCES

NASA provides a variety of on-line services via the Internet, including photographs, scientific and technical information, news releases, and organizational data. NASA offers a ever expanding suite of on-line information resources that provide important information on its strategic plan, budget, accountability, cost benefit and metrics, enterprises, major programs, news releases and notices, and new and historical bibliographic data. This information can be accessed at NASA's Internet Homepage [http://www. nasa.gov].

NASA has designated the LaRC as the lead center for access to their on-line information resources. A complete listing and Internet access can be found at the LaRC Homepage [http://www.larc.nasa.gov]. A keyword access to the guide to NASA on-line resources can be accessed on the NASA Search Internet Homepage at [http://www. nasa.gov/search/index.html].

The on-line information allows access to:

- NASA information by subject area

- Each NASA research center, its databases, and other related information

- NASA gophers, servers, and anonymous file transfer protocol (FTP) sites

- Other NASA-related sites (i.e., the National Space Science Data Center, Space Link, JPL Extragalatic Database, and the Compton Gamma Ray Observatory).

NASA also provides copies of all non-limited technical reports to the Department of Commerce's (DOC) National Technical Information Service (NTIS) and most of the restricted or limited access and all of the non-limited reports to DoD's Defense Technical Information Center (DTIC). NASA can also be accessed through the DTIC Secure Scientific and Technical Information Network (S-STINET), an on-line database. NASA does hold some information back because of international partnership agreements, proprietary data rights, or Small Business Innovation Research (SBIR) programs. The on-line databases do not include classified information that NASA does for DoD.

For specific information on NASA projects, NASA research centers have to be contacted on an individual basis. Most bibliographic information on classified projects should be available from the DTIC's Technical Reports (TR) database. These can be accessed through S-STINET (on-line and Internet accessible) databases or the Defense RDT&E Online System (DROLS) on-line database.

SCIENCE AND TECHNICAL INFORMATION (STI) PROGRAM

NASA's STI program is an essential product of research and facilitates technology transfer to enhance the competitive edge of U.S. aerospace companies and educational institutions. The STI program is based on customer needs and partnership arrangements within the agency and other federal agencies, industry, and international cooperative partners. STI is the result of scientific and technical research and mission-related activities at NASA. STI includes facts, theory, observations, and any other type of results from research or technical operations in any scientific or technical area. STI is a collection of data (in any media format) that represents a body of scientific, technical, or management knowledge identified as having value to accomplish NASA's mission.

The STI database consists of 3 million records—unclassified information only dating back to 1915—and increases at a rate of 90,000 records annually. The records represent summaries of ongoing and completed research projects, journal articles, patents, reports, dissertations, and software on a variety of topics, with an emphasis on aeronautical and aerospace technology. The literature comes from many sources including NASA and its contractors, other government agencies, institutions, universities, and domestic and foreign private firms. Examples of STI products are research reports, journal articles, numerical data sets, wind tunnel and scientific data, technical videos, scientific and technical photographs, on-line scientific bibliographic databases, and technical resource locators. These products can include laboratory notes, preliminary technical information, lessons learned, scientific and technical operational information, and management information related to the operation of NASA technical programs and projects.

The NASA STI program provides direct Internet access to nearly all this information and offers a powerful search capability to over 3 million historical aerospace, aeronautic, and related citations; a photo gallery; and report releases. It also offers access to unclassified/unlimited and limited distribution technical reports. Access to limited-distribution information requires registration, and release is contingent on the specific user profile developed by NASA. NASA's STI Internet address is [http://www.sti.nasa.gov].

NASA's STI program is managed by the LaRC and provides access to research efforts at all NASA research centers. For more information on the STI program and products, contact the NASA Center for Aerospace Information (CASI) at 301-621-0390 or e-mail [help@sti.nasa.gov]. The STI products and on-line information services most useful for DoD S&T inquiries include, but are not limited to:

- **NASA Technical Report Server (NTRS).** NTRS provides access to a bibliographic database that provides open access information on all unlimited/ unclassified NASA reports back to 1952. NTRS' Internet address is [http://techreports.larc.nasa.gov/cgi-bin/NTRS].

- **Center for AeroSpace Information (CASI) Technical Report Server (TRS) (RECONselect).** The CASI TRS (RECONselect) is a field searchable WAIS database that contains NASA-produced technical reports and aerospace-related open literature from 1970 through current. These documents were selected from the NASA RECON databases. CASI TRS RECONselect's Internet address is [http://www.sti.nasa.gov/RECONselect.html].

- **NASA RECONplus.** NASA RECONplus is the primary on-line data retrieval system for the NASA STI databases, which include all unclassified/ unlimited and limited distribution STI information. Five databases contain bibliographic citations to worldwide aerospace-related information on aeronautics, astronautics, chemistry and materials, engineering, geosciences, and space sciences published from 1915 to the present. RECONplus users must be registered, and access is dependent on a specific user profile. RECONplus' Internet address is [http://www.sti.nasa.gov/reconplus/RECONplus.html].

- **Electronic Selected Current Aerospace Notices (E-SCAN).** E-SCAN is an electronic awareness journal, published twice monthly, that provides information on recently released reports and journal literature pertaining to aeronautical and aerospace research. E-SCAN covers the full spectrum of literature but segments into subject groupings or topics and announces documents simultaneously in all relevant topics. E-SCAN's Internet address is [http://www.sti.nasa.gov/scan/scan.html].

- **STI Program Bibliographic Announcements.** NASA has several electronic announcements of new STI information, including the STI bulletin, Scientific and Technical Aerospace Reports (STAR), aerospace medicine and biology, aeronautical engineering, patent abstracts, and Advisory Group for Aerospace Research and Development (AGARD) reports. NASA also has a video catalog. The STI Program Bibliographic Announcements' Internet address is [http://www.sti.nasa.gov/sti-pubs.html].

- **NASA Image eXchange (NIX).** This site allows users to search distributed photo databases at NASA Centers. NIX's Internet address is [http://nix.nasa.gov].

TECHNOLOGY TRANSFER

For more than 30 years, the secondary use of NASA technology and its impact on the economy and global competition has been facilitated through NASA's Commercial Development and Technology Transfer Program. This mechanism is employed to transfer to the public and private sector the new technologies developed during NASA activities. Such wide distribution and outreach activities have resulted in private industry's application of NASA-generated technology. Frequently, this leads to the development of commercially available products and services (spinoffs). NASA's Publication *Spinoff* captures between 40 and 50 of these success stories annually. The Spinoff Center for AeroSpace Information Technology Transfer Office's Internet address is [http://www.sti.nasa.gov/tto/spinoff.html].

VII. NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

NIST, formerly the National Bureau of Standards (NBS), was established by Congress in 1901 to support industry, commerce, scientific institutions, and all branches of government. In creating the NBS, Congress sought to redress a long-standing need to provide standards of measurement for commerce and industry and to support the "technology infrastructure" of the 20th Century. In World Wars I and II, the NBS was deeply involved in mobilizing science to solve pressing weapons and war materials problems. After World War II, basic programs were established in nuclear and atomic physics, electronics, mathematics, computer research, and polymers and in instrumentation, standards, and measurement research.

Several key legislative mandates that have shaped NIST's role in science and technology (S&T):

- **Stevenson-Wydler Act.** This act was implemented throughout the federal laboratories to promote cooperative research and technology (R&T) transfer activities.

- **The Omnibus Trade and Competitiveness Act of 1988.** This act changed the name from NBS to NIST and augmented the mission by creating new programs to help industry speed the commercialization of new technology.

- **NIST Authorization Act of 1989.** This act created the Department of Commerce's (DOC) Technology Administration to perform periodic critical examinations of NIST's role in economic growth.

NIST assists industry in developing the technology needed to improve product quality, modernize manufacturing processes, ensure product reliability, and facilitate rapid commercialization of products based on new technology. NIST's primary mission is to promote U.S. economic growth by working with industry to develop and apply technology, measurements, and standards. It carries out its mission through four major programs:

1. Advanced Technology Program (ATP)

2. Manufacturing Extension Partnership (MEP)

3. Measurement and Standards Laboratories

4. National Quality Program.

Information about these programs can be found on NIST's Internet Homepage. NIST's Internet address is [http://www.nist.gov].

PROGRAMS

Advanced Technology Program (ATP)

The ATP is a unique partnership between the government and private industry to accelerate the development of high-risk technologies that promise significant commercial payoffs and widespread benefits for the economy. The ATP focuses on the technology needed by U.S. industry and works by encouraging changes in how industry approaches R&D and by providing mechanisms for industry to extend its technological reach. It does not fund product development but does support enabling technologies essential for developing new products, processes, and services across diverse application areas. Some programs may have military applications (i.e., manufacturing composite structures and computer-integrated manufacturing for electronics).

For more information about the ATP projects, call 301-975-5187. Additional information about ATP programs can be found on the Internet. ATP's Internet address is [http://www.atp.nist.gov].

Manufacturing Extension Partnership (MEP)

The NIST Manufacturing Extension Partnership is a nationwide network of locally managed centers offering technical assistance and the newest business practices to help the nation's 381,000 small- and medium-sized manufacturers improve their competitiveness. All centers rely on experienced field agents who work directly with smaller manufacturers to address their most critical needs. Typical MEP services include helping small manufacturers access information on new equipment (i.e., automation systems), find high-quality consultant advice for optimizing manufacturing systems, reduce costs by lowering waste, improve quality, expand markets for products, and find financing for modernization efforts.

MEP extension centers are designed to help link sources of improved manufacturing technology and the small and mid-sized companies that need it. Center staff work

with individual companies or with groups of companies organized around common needs, industries, or technologies. While each center tailors its services to meet the needs dictated by its location and manufacturing client base, some common services are offered by most extension centers. These services include helping manufacturers assess their current technology and business needs, define avenues for change, and implement improvements. Many centers also assist companies with quality management, work force training, workplace organization, business systems, marketing, or financial issues.

For more information about MEP, the toll-free number 1-800-MEP4MFG or 1-800-637-4634. This call will be automatically routed to the MEP center that serves your region. Additional information about MEP programs can be found on the Internet. MEP's Internet address is [http://www.mep.nist.gov].

Measurement and Standards Laboratories

Measurement and Standards Laboratories develop and deliver measurement techniques, test methods and standards, and other infrastructural technologies and services that provide a common language needed by industry in all stages of commerce, R&D, production, and marketing.

The NIST Laboratory program covers critical areas (i.e., physics, electronics and electrical engineering, chemical science and technology, materials science, and information technology). This program comprises seven laboratories:

1. **Building and Fire Research Laboratory (BFRL).** BFRL is the national laboratory dedicated to enhancing the competitiveness of U.S. industry and public safety performance prediction methods, measurement technologies, and technical advances needed to ensure the life cycle quality and economy of constructed facilities. Its products are used by those who own, design, construct, supply, and provide for the safety or environmental quality of constructed facilities. BFRL's Internet address is [http://www.bfrl.nist.gov].

2. **Chemical Science and Technology Laboratory (CSTL).** As the nation's reference Llaboratory, CSTL's provides the chemical measurement infrastructure to enhance U.S. industry's productivity and competitiveness; ensure equity in trade; and improve public health, safety, and environmental quality. CSTL's Internet address is [http://www.cstl.nist.gov].

3. **Electronics and Electrical Engineering Laboratory (EEEL).** EEEL promotes U.S. economic growth by providing measurement capability that is focused primarily on the critical needs of the U.S. electronics and electrical

industries and their customers and suppliers. EEEL's Internet address is [http://www.eeel. nist.gov].

4. **Information Technology Laboratory (ITL).** ITL responds to industry and user needs for objective, neutral tests for information technology. These are the enabling tools that help companies produce the next generation of products and services and that help industries and individuals use these complex products and services. ITL works with industry, research, and government organizations to develop and demonstrate tests, test methods, reference data, proof of concept implementations, and other infrastructural technologies. ITL's Internet address is [http://www.itl.nist.gov/aboutitl.htm].

5. **Manufacturing Engineering Laboratory (MEL).** MEL serves as a central research laboratory for manufacturing infrastructure technology, measurements, and standards. It provides industry-needed manufacturing engineering tools, interface standards, manufacturing systems architectures, and traceability. MEL's Internet address is [http://www.mel.nist.gov/melhome.html].

6. **Materials Science and Engineering Laboratory (MSEL).** MSEL works with industry, standards bodies, universities, and other government laboratories to improve the nation's measurements and standards infrastructure for materials. MSEL's Internet address is [http://www.msel.nist.gov].

7. **Physics Laboratory.** The Physics Laboratory supports United States' industry by providing measurement services and research for electronic, optical, and radiation technologies. It pursues directed research in the physical sciences; develops new physical standards, measurement methods, and data; conducts an aggressive dissemination program; and collaborates with industry to commercialize inventions and discoveries. The Physics Laboratory's Internet address is [http://www.physics.nist.gov].

Work is being done in critical technologies and components relevant to military R&D and applications. NIST laboratories have or are preparing on-line access to their individual databases.

Additional information about the NIST's laboratory program can be found on the Internet. The Measurement and Standards Laboratories' Internet address is [http://www. nist.gov/labs2.htm].

National Quality Program

To assist U.S. businesses and non-profit organizations in delivering ever-improving value to customers, to enhance marketplace success, and to improve overall

company performance and capabilities, NIST's National Quality Program uses the Malcolm Baldrige National Quality Award. Congress established the award program in 1987 to recognize U.S. companies for their achievements in quality and business performance and to raise awareness about the importance of quality and performance excellence as a competitive edge.

Malcolm Baldrige was Secretary of Commerce from 1981 until his death in a rodeo accident in July 1987. Baldrige was a proponent of quality management as a key to this country's prosperity and long-term strength. He took a personal interest in the quality improvement act that was eventually named after him and helped draft one of the early versions. In recognition of his contributions, Congress named the award in his honor.

NIST's National Quality Program's Internet address is [http://www.quality.nist.gov].

THE VIRTUAL LIBRARY

The NIST Virtual Library can be accessed on the Internet. This library provides an on-line library catalog, including citations, to all materials in the NIST research library: books, journals, software, videos, and all NIST publications. For more information, call 301-975-4465. The NIST Virtual Library's Internet address is [http://nvl.nist.gov].

OTHER NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST) SERVICES

NIST provides many services and programs to help U.S. industry and trade, other government agencies, academia, and the general public to improve quality, reduce cost, and strengthen the competitiveness of domestically manufactured products. Services include calibration and laboratory accreditation services, coordination of metric usage, and the Small Business Innovation Research Program (SBIR).

For information on NIST programs and publications, call 301-975-3058. NIST's products and services are also listed on the NIST Products and Services Homepage. The Internet address is [http://www.nist.gov/servb.htm].

Technology Services Program

NIST also provides access to international, uniform practices (i.e., standards in trade, standard reference material, standard reference data, and standards for weights and measurements) through its Technology Services program. Under the direction of Technol-

ogy Services, NIST provides a wide variety of services and programs to help U.S. industry and trade, other government agencies, academia, and the general public improve the quality, reduce the cost, and strengthen the competitiveness of their products to sustain economic growth. The TEchnology Services Information System (TESIS) provides access to international, uniform practices (i.e., standard reference materials, standard reference data, and standards for weights and measures).

Additional information about the Technology Services program can be found on the Internet. The Technology Services' Internet address is [http://ts.nist.gov/ts/htdocs/servprog.htm].

VIII. NATIONAL SCIENCE BOARD (NSB)

The NSB was established by the National Science Foundation (NSF) Act of 1950. The NSF was established to promote the progress of science; to advance the national health, prosperity, and welfare; and to secure national defense. The NSF would consist of the National Science Board (NSB) and a Director. As amended, the NSF Act also requires the NSB to render to the president and Congress—every even-numbered year—a report that indicates the state of science and engineering in the United States.

The principal purpose for the NSB and the NSF was to provide the president and Congress with objective, quantitative information on the status of the nation's science and engineering resources. This information is used to formulate science and technology (S&T) policy. Other activities that have been incorporated into the NSF Act of 1950 include:

- A comprehensive review detailing the significant areas of basic research in the United States and showing these areas separately by university, industry, and government—a review that should also indicate work being done by friendly foreign countries

- A comparable survey detailing the existing support for graduate and under-graduate education in the sciences by public and private agencies

- A quantitative study of the scientific manpower resources of the United States, including scientific and technical specialties and degrees of proficiency, years of experience, and so forth.

The NSB consists of the NSF Director and 24 part-time members, each appointed by the president, with the advice and consent of the Senate. They are selected—on the basis of their eminence in basic, medical, or social sciences; engineering; agriculture; edu-cation; research management; or public affairs—to represent the views of the scientific and engineering leaders in all areas. The term of service is 6 years, with no more than two con-secutive terms. Much of the NSB's work is done by standing and ad-hoc committees or the NSF staff. The board meets eight times a year.

The NSB has dual responsibilities: national science policy advisor to the president and Congress and governing body for the NSF.

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The NSB's mandated role in directing national science and engineering policy, other than its report to the president and Congress, does not appear to have any formal process. The Director of NSF, who is also the Director of the NSB, serves on the National Science and Technology Council (NSTC) and is a committee chair. Discussions with NSF staff confirmed that the NSB has not played a major role in science and technology policy during the last 10 years. However, the new director has begun to take measures to strengthen the NSB's role in formulating S&T policy and in deciding on the disbursement of funding resources in support of basic research.

NSB can be reached at its Internet address [http://www.nsf.gov/nsb/start.htm] or by calling 703-306-2000.

IX. NATIONAL SCIENCE FOUNDATION (NSF)

The NSF is an independent U.S. government agency responsible for promoting science and engineering through programs that invest over $3.3 billion per year in almost 20,000 research and education projects. The NSF was established by the National Science Foundation Act of 1950 to promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense. The NSF Act also established the National Science Board (NSB), with the principal purpose of providing the president and the Congress with objective, quantitative, information on the nation's science and engineering resources as a basis for the formulation of science policy. The NSF was given additional mandates to submit a bi-annual report to Congress on the state of science and engineering in the United States. It also requires the NSF "to provide a central clearing-house for the collection, interpretation, and analysis of data on scientific and engineering resources and to provide a source of information for policy formulation by other agencies of the federal government."

Although the NSF budget of nearly $3.4 billion is used to fund non-defense research and education projects in science and engineering, many of the research areas have a direct role in supporting the knowledge base, intellectual capital, and research infrastructure that is critical to existing and future defense needs. The NSF spends approximately 56 percent of its authorized budget to support research projects. The research projects provide support for individuals and small groups devoted to disciplinary research in traditional fields and to cross-disciplinary fields. Investments also include some support for research centers (approximately $208 million for FY 1998). The NSF also provides funding for the support of large, multi-user research facilities that are characteristically complicated and expensive and require long-term commitments of support. Approximately 20 percent (approximately $684 million for FY 1998) of its budget is used to support research facilities. The NSF also spends an additional 20 percent (approximately $669 million for FY 1998) of its budget funding on education and training programs at all educational levels. Approximately 4 percent of the NSF budget is for administrative and management expenses.

The NSF does not perform any research or engineering projects but uses grants or cooperative programs to achieve most of its overall research and educational program objectives. The NSF's investment objectives are to:

- Enable the United States to uphold a position of world leadership in science, mathematics, and engineering

- Promote the discovery, integration, dissemination, and employment of new knowledge in service to society

- Achieve excellence in U.S. science, mathematics, engineering, and technology education at all levels.

The NSF pursues these goals through four core strategies:

1. Developing intellectual capital

2. Strengthening the physical infrastructure

3. Integrating research and education

4. Promoting partnerships, including those between the academic community, industry, state and local governments, and other federal agencies.

The NSF can be reached at 703-306-1234 or accessed through the Internet. The NSF's Internet address is [http://www.nsf.gov].

THE KEY FUNCTIONAL OFFICES FOR NATIONAL SCIENCE FOUNDATION (NSF) MISSION REQUIREMENTS

The National Science Board (NSB)

The NSB consists of 24 part-time members and a Director, who is also the NSF Director, appointed by the president and confirmed by the Senate. They are selected—on the basis of their eminence in basic, medical, or social sciences; engineering; agriculture; education; research management; or public affairs—to represent the views of the scientific and engineering leaders in all areas. The term of service 6 years and is limited to two consecutive terms. The NSB has dual responsibilities: as the national science advisor to the president and Congress and as the governing body for the NSF. Much of the work is done by committees. Meetings open to the public are held eight times a year. The NSB staff offices can be reached at 703-306-2000 or accessed at the NSF Internet Homepage [http://www.nsf.gov].

The Division of Science Resources Studies (SRS)

The SRS Division fulfills the legislative mandate of the NSF Act to "provide a central clearinghouse for the collection, interpretation, and analysis of data on the availability of, and current and projected need for, scientific and technical resources in the United States and to provide a source of information for policy information by other agencies in the federal government." To carry out this mandate, the SRS Division designs, supports, and directs approximately 14 periodic surveys and several other data collections and research projects. These surveys yield the materials for SRS staff to compile, analyze, and disseminate quantitative information on domestic and international resources devoted to science and engineering and technology.

Each year, the SRS Division produces approximately 30 publications, which can be roughly divided into four categories:

1. Detailed statistical tables reports and selected data tables reports from the surveys

2. Periodic "overview" reports (i.e., Science and Engineering Indicators or National Patterns of R&D Resources)

3. Periodic reports of focused topics (i.e., International Science and Technology Data Update)

4. Special reports.

Publications are grouped according to the NSF program office that produces them. The four groups are:

1. R&D statistics

2. Education statistics

3. Science and engineering indicators and international comparisons

4. Science and engineering work force statistics.

The SRS Division works closely with other federal agencies [i.e., the National Institutes for Health (NIH), the National Center for Education Statistics, Census Bureau (conducts many of the surveys), Bureau of Labor Statistics, Patent and Trademark Office (PTO), and the International Trade Administration (ITA)]. All federal agencies that perform research and development (R&D) participate in providing data for the SRS federal funds reports.

The SRS Division also maintains several on-line databases that can be accessed through the Internet Homepage [http://www.nsf.gov/sbe/srs] and computer tapes

containing microdata (limited access) on respondent surveys. Also, statistics from over 70 other federal government agencies can be accessed from this Internet site. The databases include SESTAT, which is an integrated system of information on employment, education, and demographics of U.S. scientists and engineers, and data briefs and reports, which summarize the findings of each survey or analytic study.

MISSION AREAS

The NSF has three specific mission areas in support of science and technology (S&T) in the United States:

1. To serve as the national science advisor to the president and Congress, which is accomplished through the NSB

2. To function as the nation's clearinghouse for the collection, interpretation, and analysis of data on science and engineering resources, which is accomplished by the SRS Division within the NSF Directorate for Social, Behavioral, and Economic Sciences

3. To promote progress of science and engineering, which is accomplished through the NSF program areas.

PROGRAM AREAS

The NSF program areas are as follows:

- **Biology.** This program is managed by the Directorate of Biological Sciences [http://www.nsf.gov/home/bio].

- **Computer and Information Sciences.** This program is managed by the Directorate of Computer Information and Sciences and Engineering [http://www.nsf.gov/home/cise].

- **Crosscutting Programs.** This program is managed by the Directorate for Crosscutting Programs [http://www.nsf.gov/home/crssprgm].

- **Education.** This program is managed by the Directorate for Education and Human Resources [http://www.nsf.gov/home/ehr].

- **Engineering.** This program is managed by the Directorate for Engineering [http://www.nsf.gov/home/eng].

- **Geosciences.** This program is managed by the Directorate for Geosciences [http://www.nsf.gov/home/geo].

- **International.** This program is managed by the Division of International Research and Education [http://www.nsf.gov/sbe/int], which is part of the Directorate for Social, Behavioral, and Economic Sciences.

- **Math/Physical Sciences.** This program is managed by the Directorate for Mathematics and Physical Sciences [http://www.nsf.gov/home/mps].

- **Polar Research.** This program [http://www.nsf.gov/home/polar] is managed by the Office of Polar Programs (OPP) [http://www.nsf.gov/od/opp].

- **Science Statistics.** This program is managed by the Division of Science Resource Studies [http://www.nsf.gov/sbe/srs], which is part of the Directorate for Social, Behavioral, and Economic Sciences.

- **Social/Behavioral Sciences.** This program is managed by the Directorate for Social, Behavioral, and Economic Sciences [http://www.nsf.gov/home/sbe].

PROGRAM DIRECTORATES

The Directorates of the science and engineering programs do not perform actual R&D work. The NSF program staffs administer and manage programs being conducted by individuals, research centers, and other related institutions. All the Program Directorates, their operating divisions, points of contact (POCs), and activity summaries can be accessed through the NSF Internet Homepage [http://www.nsf.gov].

Some specifics on the Directorates' individual activities are:

- **Biological Sciences.** This directorate fosters the understanding of the underlying principals and mechanisms governing life. It can be accessed on the Internet at [http://www.nsf.gov/bio].

- **Computer Information Sciences and Engineering.** This directorate supports research on the theory and foundations of computing, system software, and computer system design, as well as prototyping, testing, and development of cutting-edge computing and communications systems to address complex research problems. It can be accessed on the Internet at [http://www.cise.nsf.gov].

- **Crosscutting Programs.** This directorate supports work requiring the perspectives and contributions of various disciplines: programs that integrate research and education and programs that support collaborative efforts between NSF and other federal, academic, and public/private sector partners. It can be accessed on the Internet at [http://www.nsf.gov/home/crssprgm].

- **Education and Human Resources.** This directorate makes grants and awards in all areas of science, mathematics, and engineering education. It can be accessed on the Internet at [http://www.ehr.nsf.gov].

- **Engineering.** This directorate invests in engineering research in all engineering disciplines and state-of-the art manufacturing and engineering education. It can be accessed on the Internet at [http://www.eng.nsf.gov].

- **Geosciences.** This directorate supports research in the atmospheric, earth, and ocean sciences, including resources (i.e., water, energy, minerals and biological diversity). It can be accessed on the Internet at [http://www.geo.nsf.gov].

- **Mathematics and Physical Sciences.** This directorate supports research in mathematics, astronomy, physics, chemistry, and materials sciences. It can be accessed on the Internet at [http://www.nsf.gov/mps].

- **Social, Behavioral, and Economic Sciences.** This directorate supports research in social, behavioral, and economic research. It also provides tools for tracking human and institutional resources that are vital to building the nation's science and engineering infrastructure. It can be accessed on the Internet at [http://www.nsf.gov/sbe].

OTHER NATIONAL SCIENCE FOUNDATION (NSF) OFFICES AND INTERNET SITES

Several offices involved in NSF science and engineering activities are also assigned to the Director of NSF: the Office of Polar Programs and the Office of Science and Technology Infrastructure.

Office of Polar Programs (OPP)

The OPP science program recognizes the uniqueness of the polar regions as a premier natural laboratory for conducting research that can only or best be undertaken in the polar regions. These science programs approach polar research from the following three major perspectives.

1. **Fundamental research to understand Earth and its systems.** This includes research, programs, and activities that contribute to an understanding of the scientific questions associated specifically with the polar regions. Examples include the importance of the poles in Earth's climatic heat balance and the thermohaline circulation of the polar oceans; the special adaptations of polar organisms (i.e., ice algae and ice fish); and the unique contributions of

the two regions to understanding global systems (i.e., the more than 400,000-year climate record contained in ice cores).

2. **Exploration of the geographical frontier.** Research programs and activities across many fields of science explore this little-known geographic frontier to advance science and education. For example, the central Arctic Ocean and the southern oceans are the least studied regions of the world oceans, especially during the winter.

3. **Science enabled by the polar setting.** The Arctic and Antarctic provide opportunities or conditions that enable research that is not possible elsewhere or that can be most effectively conducted in the polar regions. For example, in both polar regions, unique conditions provide a window for astrophysical study of the origins of the universe.

Research supported by OPP ranges from individual investigator projects, through multi-disciplinary teams of researchers, to large multinational cooperative programs. Because the polar regions have a prominent role in global systems and processes and, consequently, global change research, many of the priorities focus on programs that involve investigators from many disciplines and institutions over several years. International cooperation is a hallmark of polar research.

Additional information is available on the OPP Internet Homepage. OPP's Internet address is [http://www.nsf.gov/od/opp].

Office of Science and Technology Infrastructure (OSTI)

OSTI, Internet address [http://www.nsf.gov/od/osti], administers the NSF Science and Technology Center (STC) program. The NSF established the STC program in 1987, as part of the President's State of the Union Address, to fund important basic research and education activities and to encourage technology transfer and innovative approaches to interdisciplinary program. The centers have the opportunity to explore new areas and build bridges among disciplines, institutions, and other sectors. They offer the basic research community a significant mechanism to take a longer term view of science and explore better and more effective ways to educate students.

The STC's Internet address is [http://www.nsf.gov/od/osti/centers/start.htm].

Specifically, STC support enables academic research teams to:

- Exploit opportunities in science and engineering where the complexity of the research problems or the resources needed to solve them require the

advantages of scale, duration, facilities, or collaborative relationships that can be best provided by campus-based research centers

- Involve students, research scientists, and engineers from academia, industry, non-profit organizations, and federal laboratories in partnerships to enhance the training and employability of professionals with an awareness of potential applications for scientific discoveries

- Receive long-term, stable funding at a level that encourages risk-taking and ensures a solid foundation for attracting quality undergraduate and graduate students into science and technology careers

- Facilitate the transfer of knowledge among academia, industry, and national laboratories.

Presently, the 24 STCs are under the direction of 5 NSF directorates. Each of these STCs can be accessed from the Internet address [http://www.nsf.gov/od/osti/centers/stcaward.htm].

- **Directorate of Biological Sciences**
  - Biological Timing
  - Engineering Plants for Resistance Against Pathogens
  - Molecular Biotechnology
  - Light Microscope Imaging and Biotechnology
  - Microbial Ecology

- **Directorate of Social, Behavioral, and Economic Sciences**
  - Research in Cognitive Science

- **Directorate of Computer Information Sciences and Engineering**
  - Discrete Mathematics and Theoretical Computer Science
  - Computer Graphics and Scientific Visualization
  - Research on Parallel Computation

- **Directorate of Geosciences**
  - Southern California Earthquake Center
  - Clouds, Chemistry, and Climate
  - Astrophysical Research in Antartica
  - Analysis and Prediction of Storms
  - High-Pressure Research

- **Directorate of Mathematics and Physical Sciences**
  - Advanced Liquid Crystalline Optical Materials
  - Superconductivity
  - Computation and Visualization of Geometric Structures
  - High-Performance Polymeric Adhesives and Composites
  - Quantized Electronic Structures
  - Ultrafast Optical Science
  - Particle Astrophysics
  - Advanced Cement-Based Materials
  - Synthesis, Growth, and Analysis of Electronic Materials
  - Photoinduced Charge Transfer.

LINKS OUTSIDE THE NATIONAL SCIENCE FOUNDATION (NSF)

Links to all the NSF-funded research centers, federal laboratories, all Federally Funded Research and Development Centers (FFRDCs), federal agencies, other U.S. science organizations, and international science organizations can be accessed through the Internet at [http://www.nsf.gov/home/external].

X. NATIONAL SCIENCE FOUNDATION (NSF): SCIENCE AND ENGINEERING INDICATORS REPORT

The Science and Engineering Indicators Report is mandated by the NSF Act of 1950, as amended, which required the National Science Board (NSB) to render to the president and Congress—every even-numbered year—a report that indicates the state of science and engineering in the United States. In September 1950, concern that the Korean War could turn into a protracted conflict prompted the Bureau of the Budget to commission a study by the NSF to conduct several surveys and assessments including:

- A comprehensive review of basic research areas being investigated in the United States, indicating the research support for these areas separately by universities, industry, and government

- A comparable study detailing the support for graduate and undergraduate education in the sciences and engineering at private and public agencies

- A quantitative study of the scientific manpower resources of the United States (e.g., scientific and technical specialties, degrees of proficiency, level of education, and so forth)

- A review of basic research activities in government agencies.

Many of these objectives were included in the early versions of the Science and Engineering Indicators Report. The initial goal of the report was to describe major scientific advances and technology achievements and to gauge the contributions of science and technology (S&T) to national goals and to the national welfare. Additional requirements for the report have been effected by the changing national and international commitments, changing national priorities, and the need for better accountability in the public sector. The changes have increased the need to better understand and measure past trends and current levels of effort and capabilities in science and engineering and to monitor international trends in S&T. The report now provides a useful benchmark to measure the performance of the nation's science and engineering enterprise and has continually expanded its coverage of international S&T activities.

The Science and Engineering Indicators Report has detailed statistics and analysis of trends covering:

- Elementary and secondary education in science and mathematics and higher education in science and engineering

- The science and engineering work force

- Research and development (R&D): financial resources and institutional linkages

- Academic R&D: infrastructure and performance

- Technology development and diffusion

- Economic and social significance of scientific and engineering research.

The NSF Science and Engineering Indicators Report is a reference document and a policy document that serves a much broader audience, including decision-makers in government, industry, academia, non-profit organizations, and professional societies. One of the continuing objectives of this report is to identify and follow changes in the science and engineering fields over time to reveal strengths and potential problems. A second objective of the report is to enhance the worldwide dissemination of S&T data and analysis. The Science and Engineering Indicators Report can be accessed on the Internet at the NSF Internet Homepage [http://www.nsf.gov] or directly using the address [http://www.nsf.gov/sbe/srs/seind].

XI.   NATIONAL SCIENCE AND
TECHNOLOGY COUNCIL (NSTC)

The NSTC, a cabinet-level council, is the principal means for the president to coordinate science, space, and technology policies across the federal government. It acts as a "virtual" agency for science and technology (S&T) to coordinate the diverse parts of the federal research and development (R&D) enterprise. It is chaired by the president. Membership consists of the vice president, cabinet secretaries, agency heads with significant science and technology (S&T) responsibilities, the assistant to the president for S&T, and other White House officials.

The NSTC was established by Executive Order 12882 in November 1993. It consolidates the responsibilities of several interagency councils [e.g., the Federal Coordinating Council of Science, Engineering, and Technology (FCCSET), the National Aeronautics and Space Council, and the National Critical Materials Council]. It is charged with looking forward to next century and projecting a vision and a strategy for federal R&D enterprises.

The NSTC's main objective is to establish clear national goals for federal S&T investments in areas ranging from information technologies and health research to improving transportation systems and strengthening fundamental research. It prepares R&D strategies that are coordinated across federal agencies to form an investment package aimed at accomplishing multiple national goals.

To orient S&T toward achieving national goals, nine goal-orientated committees were established to prepare coordinated R&D strategies and budget recommendations:

1. Committee on Health, Safety, and Food
2. Committee on Fundamental Science
3. Committee on Computing, Information, and Communications
4. Committee on Environment and Natural Sciences
5. Committee on Technological Innovation
6. Committee on Education and Training
7. Committee on Transportation

8. Committee on National Security

9. Committee on International Science, Engineering, and Technology.

Each committee is chaired by a senior official or officials from a federal agency/department and is co-chaired by a White House/Office of Science and Technology Policy (OSTP) Senate-confirmed Associate Director.

In addition to the nine standing committees, the NSTC establishes ad hoc working groups as needed to review and coordinate specific policies and programs.

NSTC's Internet address is [http://www1.whitehouse.gov/WH/EOP/OSTP/NSTC/html/NSTC_Home.html]. NSTC publications can be viewed at this address. A key document is the Executive Summary of (year) Strategic Plans.

For more information or to obtain copies of NSTC documents, contact the OSTP Executive Secretariat Office at 202-456-6100. To request a copy of a specific report, send a blank e-mail message to (Report-Abbreviation) [exsum@nstc.eop.gov].

XII. NATIONAL TECHNICAL INFORMATION SERVICE (NTIS)

The NTIS is a non-appropriated bureau within the Technology Administration of the Department of Commerce (DOC). It serves as the nation's clearinghouse for *unrestricted* research and development (R&D) results and other information produced by and for the U.S. government. It collects scientific, technical, engineering, and business-related information and then organizes, maintains, and disseminates this information in several formats. It is the nation's largest central resource and primary disseminator of information produced by the government and worldwide, mainly from government sources.

All costs associated with collecting, abstracting, indexing, archiving, reproducing, and disseminating the information NTIS collects are paid from sales of its products and services. Products include information on audio cassettes, videotapes, printed technical reports, periodicals, on-line via Internet, computer tapes and diskettes, and compact discs (CDs).

In 1945, the Publications Board was established to review all government-generated scientific and technical research documents produced in World War II and to determine what documents could be released to U.S. industry and the general public. In 1950, the DOC was directed to operate a clearinghouse to collect and distribute scientific and technical information. In 1970, the clearinghouse was re-established as NTIS. Since 1970, NTIS has published a regular index of government-sponsored research reports. NTIS's mission is to improve the efficiency and effectiveness of U.S. R&D enterprise, increase productivity and innovation in the United States, and increase U.S. competitiveness in the global economy.

The NTIS information collection covers more than 375 scientific, technical, engineering, and business-related subjects collected from more than 200 U.S. government agencies and organizations including the National Aeronautics and Space Administration (NASA), the Environmental Protection Agency (EPA), the National Institute of Standards and Technology (NIST), the National Institutes for Health (NIH), and the Departments of Agriculture (USDA), Commerce (DOC), Defense (DoD), Energy (DOE), Health and Human Services (HHS), Interior (DOI), Labor (DOL), and Transportation (DOT).

NTIS does not manage or disseminate classified or limited access information. It is the leading U.S. government agency in international technical and business information exchange. The American Technology Preeminence Act (Public Law 102-245), passed in 1991, requires all U.S. government agencies and their contractors to submit to NTIS their federally funded scientific, technical and engineering information within 15 days of the date the product is made publicly available.

For more information on NTIS products/orders, call 703-487-4650. For on-line help, call 703-487-4640. The NTIS products catalog is on-line and can be accessed on the Internet at [http://www.ntis.gov/search.htm].

INFORMATION TOOLS

National Technical Information Service (NTIS) Web Page

Information on NTIS and its products and services can be accessed on the Internet. NTIS's Internet address is [http://www.ntis.gov]. NTIS also has a science and technology (S&T) Homepage at [http://www.ntis.gov/scitech/scitech.htm].

Subscriptions

NTIS offers numerous printed and on-line subscriptions [http://www.ntis. gov/online.htm] to provide up-to-date listings on the most recent published findings for many subject matter areas. Some of the NTIS information most useful for S&T research efforts are:

- **NTIS OrderNow.** NTIS OrderNow is a web-based service for users to identify and purchase key research products sponsored by the U.S. government. The NTIS OrderNow Online Internet address is [http://chaos.fedworld. gov/ordernow]. This service is also offered on a CD, with information covering the last 2 years. The CD version is updated quarterly. For information about the NTIS OrderNow CD, go to Internet address [http://www.ntis. gov/ordnowcd.htm].

- **World News Connection (WNC).** WNC provides information on-line from the Foreign Broadcast Information Service (FBIS) that monitors news items from around the world. WNC can cover a specific region or country and includes open-source and gray literature on scientific, technical, and environmental issues. For information about WNC, go to Internet address [http://wnc.fedworld.gov].

- **NTIS Alerts.** NTIS Alerts provides a twice monthly update (a paper product) covering a wide range of technology topics of the latest R&D reports and studies not readily available from other sources. It includes U.S. government sources from over 100 countries worldwide. NTIS Alerts' Internet address is [http://www.ntis.gov/yellowbk/1nty169.htm].

- **NTIS database.** NTIS provides information through conventional and emerging dissemination methods. The bibliographic database can be searched either on-line or from a CD. The bibliographic database contains summaries of scientific, technical, engineering, and business information acquired from 1964 to the present. This information—available as printed reports, videos, software, and data files—represents hundreds of billions of dollars of research sponsored by the United States and foreign governments and is permanently available. Numerous printed and electronic awareness services are available to provide researchers, educators, and managers the most current government information. Most libraries have access to the database, which is also available through commercial services. The NTIS databases' Internet address is [http://www.ntis.gov/ntisdb.htm].

Some of the databases of interest are:

- *Energy Science and Technology Database (EDB).* EDB is a multidisciplinary file containing worldwide references to basic and applied scientific and technical research literature. The information is collected for government managers, researchers at national laboratories, and other research efforts sponsored by the U.S. DOE. EDB's Internet address is [http://grc.ntis.gov/energy.htm].

- *AgroBase™ database.* The AgroBase database combines two of the world's most comprehensive databases on agriculture: the Agriculture On-line Access (AGRICOLA) database and the Agricultural Science and Technology (AGRIS) database. AgroBase benefits from a composite record technology that combines duplicate records (citations) from different databases into one record while maintaining all the unique information of the original records. The AgroBase™ database Internet address is [http://grc.ntis.gov/agrobase.htm].

  - - *Agriculture On-line Access (AGRICOLA) database.* The AGRICOLA database provides a comprehensive source of agriculture and life science information. It also contains bibliographic records for documents acquired by the USDA's National Agricultural Library (NAL).

  - - *Agricultural Science and Technology (AGRIS) database.* AGRIS is a cooperative system for collecting and disseminating information on

the worlds agricultural literature in which over 100 national and multinational centers take part.

- *Federal Research in Progress (FEDRIP) database.* The FEDRIP database provides advance information for more than 150,000 ongoing federally funded research projects in the fields of physical sciences, engineering, and life sciences from 12 non-defense-related government sources, including the National Science Foundation (NSF), NIST, NASA, U.S. Geological Survey, Transportation Research Board, EPA, Department of Veteran Affairs, DOE, and NIH. Each FEDRIP entry summarizes a research project: its objectives, funding interim findings, principal investigator, and sponsoring organization. Currently, this database can only be accessed through commercial databases (i.e., DIALOG, Knowledge Express Data Systems, and NERAC). FEDRIP's Internet address is [http://grc.ntis.gov/fedrip.htm].

- **NTIS Published Services.** NTIS Published Services are bibliographies that contain 50 to 250 of the latest abstracts for research reports and studies available from the U.S. government and worldwide database sources. Experienced information specialists prepare search strategies to produce the most-up-to-date and relevant data available. With each new request (order), a new search is run, and a completely updated bibliography is produced. A catalog of published research titles will be available on-line through FedWorld and accessible through the Internet.

- **FedWorld information network.** FedWorld serves as a platform that affords agencies the opportunity to host data and communications [i.e., electronic commerce, electronic data interchange (EDI), and virtual conferences]. It also offers an on-line, dial-up, or Internet government information locator service that offers access to government information resources, including gateways that connect users with more than 300 government files, documents, and databases. FedWorld's goal is to provide a one-stop location that will enable the public to locate, order, and have delivered U.S. government information. Currently, FedWorld—which offers special on-line subscription services—provides access to over 100 government dial-up bulletin boards, most of which are not available via the Internet. FedWorld's Internet address is [http://www.fedworld.gov].

- **Electronic Commerce/Electronic Data Interchange (EC/EDI) and Continuous Acquisition and Life-Cycle Support (CALS) resource locator.** EC/EDI and CALS resource locator provides help to identify, locate, and link to no-cost Internet world wide web, file transfer protocol (FTP), Gopher, Telnet, and mailing list sites relating EC/EDI and CALS. CALS covers a wide range of DoD and other federal agencies and civil and

foreign governments. This resource locator can be accessed through the NTIS FedWorld Internet site at [http://www.fedworld.gov].

Sites

Some specific sites of interest for S&T and R&D information are:

- **Worldtec™.** Worldtec™ and Worldtec™ Briefs are international S&T alert services offered by the U.S. government. Worldtec™ offers time-sensitive and retrospective information gathered from several dozen U.S. and non-U.S. sources. Worldtec™ enables users to browse hundreds of business-related communications from U.S. embassies and international program offices. International S&T content is gleaned from speeches, seminars and workshops, internships, meetings and visits, articles, abstracts from newspapers, periodicals, and books. All material is presented in English. The Worldtec™ Internet address is [http://worldtec.fedworld.gov].

- **Government Information Locator Service (GILS).** GILS identifies public information sources throughout the U.S. government, describes the information available, and provides assistance in obtaining the information. GILS was established under direction of Office of Management and Budget (OMB) Bulletin No 95-01 and is a goal of the national information infrastructure agenda. The NTIS GILS Internet address is [http://www.fedworld.gov/gils].

Information Services

Some information services offered by NTIS are (see NTIS Homepage at [http://www.ntis.gov]):

- **NTIS on-line searching help desk.** This service assists users in their on-line searches of NTIS databases.

- **NTIS Fax Direct.** NTIS Fax Direct distributes targeted lists of scientific, technical, engineering, and business information directly to a customer's fax machine.

- **Prepackaged NTIS Alerts.** Prepackaged NTIS Alerts provides the same service as NTIS Fax Direct for 26 subject areas, many of which are defense related, to monitor a broad subject area (i.e., combustion; engines and propellants; space technology; ordnance; navigation, guidance, and control; and detection and countermeasures).

- **Selected Research in Microfiche (SRIM).** SRIM automatically sends subscribers microfiche copies of the full text of reports for a minimal charge.

Subscribers can select from 350 subject areas. As new reports enter the collection in a field selected by the subscriber, microfiche copies are sent immediately, often before their availability is announced. NTIS offers a custom SRIM service to create a profile of special interest in any of the fields selected.

- **OrderNow.** OrderNOW is an on-line ordering system that provides access to approximately 20,000 of the newest items NTIS has to offer. It covers a 90-day period.

JOINT VENTURE PROGRAM

NTIS has entered into several business relationships with commercial companies to provide on-line S&T information that is normally available through library reference services (i.e., DIALOG and Knowledge Express).

XIII. OFFICE OF SCIENCE AND TECHNOLOGY POLICY (OSTP)

OSTP was created in 1976 to provide the president with timely policy advice and to coordinate the science and technology (S&T) investment. Through the National Science and Technology Council (NSTC), OSTP helps the president coordinate science, space, and technology policy and programs across the federal government. The President's Committee on Science and Technology (PCAST) ensures public sector involvement in the work of OSTP and NSTC. OSTP plays a key role in advancing the president's agenda in fundamental science, education, and scientific literacy.

The OSTP is led by a Director and four Associate Directors, all of whom are appointed by the president and confirmed by the Senate. OSTP's responsibilities are to:

- Advise the president and Executive Branch in policy and budget development on all questions related to S&T

- Lead inter-agency efforts to develop and implement S&T policies and budgets across all federal agencies

- Coordinate the federal government's research and development (R&D) efforts to maximize the return on the public's S&T investment

- Foster strong partnerships among federal, state, and local governments and the scientific community in industry and academia

- Communicate the president's S&T policies and programs to Congress

- Address the need for appropriate resources

- Advance international cooperation in S&T.

OSTP's Internet address is [http://www.whitehouse.gov/OSTP.html].

The White House S&T documents and subscription information is available on the Internet. Documents can be viewed on the Internet or received via e-mail. The e-mail address is [Publications@pub.whitehouse.gov]. The Internet Homepage is [http://www.pub.whitehouse].

ORGANIZATION

OSTP is organized into four divisions.

Environment Division

This division's policy areas include global climate change, ozone depletion, loss of biological diversity, deforestation, pesticides and toxic substances, urban and regional air quality, environmental technologies, water quality, hazardous and solid waste, natural hazards, and marine pollution. The division's goal is to ensure a sound and technical underpinning for environmental policies and an interagency R&D strategy for environment and natural resource issues. The Environment Division's Internet address is [http://www.whitehouse.gov/WH/EOP/OSTP/Environment/html/Environment.html].

National Security and International Affairs Division

This division leads the White House effort to use S&T for our national security and to shape and coordinate international cooperation in S&T. The national policy areas include defense technology investments, technical aspects of arms control and non-proliferation policy, technology transfer and related export control policies, and intelligence technology. The international agenda includes strengthening American S&T, using international cooperation to support economic goals, and advancing international cooperation in large-scale S&T programs. The National Security and International Affairs Division's Internet address is [http://www.whitehouse.gov/WH/EOP/OSTP/Security/html/Security.html].

Science Division

This division focuses on maintaining a broad federal research program that advances the frontiers of knowledge, is based on excellence, is strongly coupled to education, and is supportive of critical national goals. The objectives are to ensure that the United States maintains global leadership in science, mathematics, and engineering and that science continues to provide support for the successful resolution of pressing national problems in health, agriculture, the economy, energy, social well-being, education, and national security. The Science Division's Internet address is [http://www.whitehouse.gov/WH/EOP/OSTP/Science/html/Science.html].

Technology Division

This division's goals are to help develop and implement federal policies for harnessing technology to serve national goals (i.e., global competitiveness, environmental quality, and national security). The division's areas of responsibility are to redirect the U.S. space and aeronautics program, including the Space Station; sustain U.S. leadership in defense technology while increasing the focus on dual-use and civil technologies; advance technologies for education; and facilitate the development and adoption of advanced manufacturing technologies and advanced computing and communication technologies. The Technology Division's Internet address is [http://www.whitehouse.gov/WH/EOP/OSTP/Technology/html/Technology.html].

XIV. PRESIDENT'S COMMITTEE OF ADVISORS ON SCIENCE AND TECHNOLOGY (PCAST)

PCAST serves as the highest level private-sector advisory group for the president and the National Science and Technology Council (NSTC), a cabinet-level council chaired by the president. The committee members—distinguished individuals appointed by the president—are drawn from industry, education, research institutions, and other non-governmental organizations. The Assistant to the President for Science and Technology (S&T) [Director of the Office of Science and Technology Policy (OSTP)] and a private sector member selected by the president co-chair the committee.

President Clinton established PCAST in 1993 by Executive Order 12882, at the same time he established the NSTC. The formal link between NSTC and PCAST is to ensure that national needs remain an overarching guide for the NSTC. PCASTS's role is to advise the president—directly or through the Director of OSTP—on issues of S&T and their roles in achieving national goals. PCAST provides feedback on federal programs to ensure that the private sector perspective is included in the policy-making process and actively advises NSTC on S&T issues of national importance. PCAST also assists the NSTC in securing private sector participation in its activities.

PCAST has drawn up the following set of principles as a framework for difficult choices in the allocation of scarce budgetary resources.

- S&T has been a major factor in the American economy and our quality of life and will be of greater importance in the years ahead.

- Public support for S&T should be considered an investment in the future.

- Education and training in science, mathematics, and engineering are crucial to America's future.

- The federal government should continue to support S&T research by investing in universities, research institutions, and national laboratories.

- The federal investment portfolio in S&T must support basic and applied research, including the development of pre-competitive technologies in cooperation with private sector and for national needs.

- Stable funding, based on long-range planning, is essential for the effective and efficient use of the federal investment in research and its associated educational function and for enhancing international collaboration.

The PCAST Executive Secretariat Office at 202-456-6100 is the point of contact (POC) for more information on PCAST and for ordering unclassified PCAST reports. Information about PCAST can also be found on the Internet. PCAST's Internet address is [http://www.whitehouse.gov/WH/EOP/OSTP/NSTC/PCAST/pcast.html].

XV. RESEARCH AND DEVELOPMENT
IN THE UNITED STATES (RaDiUS)

RaDiUS is the only comprehensive database of federally funded research and development (R&D) in the United States. It permits authorized users to track federal R&D activities on the Internet. These activities range from cabinet- and agency-level budgets and the dollars invested annually to R&D at the program, project, and award/task levels.

RaDiUS was developed by the Critical Technologies Institute (CTI), a Federally Funded Research and Development Center (FFRDC) operated by RAND. It provides analytic support to the White House Office of Science and Technology (OSTP) and the president's National Science and Technology Council (NSTC) to ensure that the federal S&T investment meets critical national goals.

RaDiUS includes only those activities that involve the expenditure of officially designated R&D dollars, as defined by agencies in applying the definitions contained in the Office of Management and Budget (OMB) Circular A-11. Procurement funds spent to support a contractors independent research and development (IR&D) efforts, for example, would not be included. RaDiUS contains aggregate and detailed information on the nature and amount of federal resources devoted to conducting R&D. It does not include information on spending for capital improvements or construction of R&D facilities, since these constitute one-time expenditures rather than continuing programs.

RaDiUS has been designed to reflect the process by which federal goals and dollars are translated into actual R&D work. The R&D goals articulated by the federal government are transformed into the R&D objectives of individual federal organizations and eventually become the day-to-day work of scientist and engineers. RaDiUS systematically details the flow of federal R&D dollars through several stages: from Congressional appropriation accounts, to central points in ever-smaller units in the federal organizational hierarchy, to the hands of those actually performing the R&D—inside and outside the federal government. RaDiUS allows users to explore the overall scope of the R&D activities and investments made by the federal government across all federal agencies; compare and contrast the R&D activities and resources invested in specific science and technology (S&T) areas of

various federal agencies; and examine in detail the R&D investment decisions and activities of specific federal agencies.

Although the federal government spends over $70 billion every fiscal year on R&D, OSTP and other federal policy-makers have not always had the means to investigate how much the federal government is spending each S&T area. Historically, the only information available to address this question was incomplete and outdated. The information was compiled retrospectively, using traditional survey techniques yielding information that was often 2 or 3 years old at the time of its release. This lack of visibility was compounded by the fact that agencies did not follow a standard format in reporting R&D information. RaDiUS has been designed by identifying various existing federal information sources containing R&D data; by designing an organizational framework to merge data into a common, relational database; and by creating an on-line database that can be searched easily.

In five levels of detail, RaDiUS describes the nature of the R&D activity and provides information on the funds devoted to each activity. Levels 1 through 4 are "ever finer" slices of the Budget Authority of the bureaucratic structure responsible for federal R&D. Level 5 records the actual awards or taskings made to contractors, grant recipients, or government laboratories. Although the dollars carried on these records are mostly obligations, some are actual costs. Each cabinet level or agency has a separate organizational hierarchy within RaDiUS.

For example, the five levels tracked for DoD are as follows:

- Level 1 is the Department of Defense (DoD)
- Level 2 is the military Service/Defense Agency
- Level 3 is the program element (PE)
- Level 4 is the projects under the PE's
- Level 5 is the awards or tasks to whomever is performing the work.

For another agency [the National Aeronautics and Space Administration (NASA)], the five levels tracked are as follows:

- Level 1 is NASA
- Level 2 is major systems/programs
- Level 3 is the sub-program
- Level 4 is individual divisions
- Level 5 is the performing contractor by NASA center.

Access to RaDiUS has been limited to OSTP but is now being offered to other parts of the federal government under OSTP's guidance. All restrictions carried on the RaDiUS data were placed on these data by the federal agencies from whom the data were obtained. It does not contain classified information; however, it does contain information that is considered sensitive and thereby exempt from the Freedom in Information Act (FOIA). Users permitted to access the restricted data are screened in consultation with the appropriate federal agencies during an authentication process and are allowed only to access those records that the federal agencies will permit them to see. CTI-RAND expects that RaDiUS will be available for use by federal contractors (i.e., FFRDCs) in the near future.

RaDiUS Information can be obtained from CTI-RAND at 202-842-5922 or by e-mail at [radius@rand.org]. Information is also available on the Internet. RaDiUS's Internet address is [http://www.rand.org/radius].

XVI. UNITED STATES DEPARTMENT OF AGRICULTURE (USDA)

The USDA is charged with a broad mandate that covers a regulatory mission; food safety and inspections; animal and plant health inspections; programs that promote and support consumer services; farm subsidies and social programs; stewardship of natural resources; rural economic development; and agricultural research and market forecasting. The USDA is one of the top federal agencies in total research and development (R&D) funding authority, with a total of $1,378 billion authorized for FY 1998. Nearly all the USDA R&D programs support basic and applied research programs.

The USDA has seven major services or program organizations with R&D concentrated in agricultural research, food safety, nutrition, pest management, and land conservation. Although most of USDA's R&D activities are not directly related to Department of Defense (DoD) science and technology (S&T) programs or acquisition interests, the USDA is an abundant information resource for critical topic areas of interest to the military Services—including planners, management offices, and program offices.

USDA organizations, subordinate agencies/organizations, mission statements, mandates, organizational hierarchy, program information, and so forth are accessible on the Internet. USDA's Internet address is [http://www.usda.gov].

For specific Information of USDA major program areas, the following list of Internet addresses is provided. The USDA Homepage [http://www.usda.gov] provides more information.

- **Research, Education, and Environment**
    - *Agricultural Research Service (ARS).* The ARS provides access to agricultural information and develops new knowledge and technology needed to solve technical agricultural problems of broad scope and high national priority. The agency maintains a network of geographically dispersed national and overseas laboratories. The ARS also maintains the National Agricultural Library (NAL). The ARS's Internet address is [http://www.ars.usda.gov].

–   *National Agricultural Library (NAL).* The NAL is one of four national libraries and has a mission to increase the availability and use of agricultural information for researchers, educators, policy-makers, consumers of agricultural products, and the public. The NAL is the nation's primary source for agricultural information and serves as the U.S. center for international agricultural information. The NAL's Internet address is [http://www.nalusda.gov].

Some key resources within the NAL are:

– –   *Technical Service Division (TSD).* TSD's mission is to identify, select, acquire, and provide bibliographic and subject access to agricultural publications and other related disciplines. It is charged with building a collection of the world's agricultural information, serving as the official repository for USDA publications, and disseminating information through Agriculture On-line Access (AGRICOLA) and other databases. The TSD's Internet address is [http://www.nalusda.gov/tsd].

– –   *Agriculture On-line Access (AGRICOLA).* AGRICOLA is a bibliographic database consisting of literature citations for journal articles, monographs, proceedings, theses, patents, translations, audiovisual material, and related subjects from 1970 to the present. On-line access is available through commercial vendors and compact disc-read only memory (CD-ROM)/magnetic tapes that can be purchased from the National Technical Information Service (NTIS) (see Section XII). AGRICOLA's Internet address is [http://www. nalusda.gov/general_info/agricola/agricola.html].

– –   *NAL information centers.* The NAL has nine subject-specific information centers that provide customized services. Through the Internet, the centers provide access to digital information, including images, databases, software, patents, bibliographies, and resource guides. They also provide subject matter expertise and "standardized" information and perform extensive outreach and collaborative activities.

1.   **Agricultural Trade and Marketing Information Center (ATMIC).**   ATMIC's Internet address is [http://www. nalusda.gov/atmic/index.html].

2.   **Alternative Farming Systems Information Center (AFSIC).** AFSIC's Internet address is [http://www.nalusda. gov/afsic/index.html].

3. **Animal Welfare Information Center (AWIC).** AWIC's Internet address is [http://www.nalusda.gov/awic/index.html].

4. **Biotechnology Information Center (BIC).** BIC's Internet address is [http://www.nalusda.gov/bic/index.html].

5. **Food and Nutrition Information Center (FNIC).** FNIC's Internet address is [http://www.nalusda.gov/fnic/index.html].

6. **Plant Genome Data and Information Center (PGDIC).** [http://www.nalusda.gov/pgdic/index.html].

7. **Rural Information Center (RIC) and RIC Health Services (RICHS).** RIC and RICHS's Internet address is [http://www.nalusda.gov/ric/richs/index.html].

8. **Technology Transfer Information Center (TTIC).** TTIC's Internet address is [http://www.nalusda.gov/ttic/index.html].

9. **Water Quality Information Center (WQIC).** WQIC's Internet address is [http://www.nalusda.gov/wqic/index.html].

– *Cooperative State Research, Education, and Extension Service (CSREES).* CSREES provides the focus to advance a global system of research extension and higher education in the food and agricultural sciences and related environmental and human sciences to benefit people, communities, and the nation. CSREES emphasizes partnerships with the public and private sectors to maximize the effectiveness of limited resources. CSREES programs increase and provide access to scientific knowledge; strengthen the capabilities of land-grant and other institutions in research, extension, and higher education; increase access to and use of improved communication and network systems; and promote informed decision-making by producers, families, communities, and other customers. CSREES's Internet address is [http://www.reeusda.gov].

– *Economic Research Service (ERS).* ERS provides economic analysis on efficiency, efficacy, and equity issues related to agriculture, food, the environment, and rural development to improve public and private decision-making. ERS is one of four agencies in the USDA's Research, Education, and Economics (REE) Mission Area. ERS's Internet address is [http://www.econ.ag.gov].

– *National Agricultural Statistics Service (NASS).* NASS serves the nation, its agriculture, and its rural communities by providing meaningful, timely,

accurate, and objective statistical information and services. Through its Washington, DC, headquarters and 45 field offices serving all 50 states, NASS publishes hundreds of reports. Some reports include production and prospects for crops, livestock, dairy, and poultry, and other reports focus on stocks, prices, labor, weather, chemical use, and similar items that concern farmers, ranchers and others involved in, or affected by, agriculture. NASS's Internet address is [http://www.usda.gov/nass].

- **Farm and Agricultural Service**

    - *Farm Service Agency (FSA).* The FAS ensures the well-being of American agriculture, the environment, and the American public through efficient and equitable administration of farm commodity programs; farm ownership, operating, and emergency loans; conservation and environmental programs; emergency and disaster assistance; domestic and international food assistance; and international export credit programs. These programs provide a safety net to help farmers produce an adequate food supply, maintain viable operations, compete for export sales of commodities in the world marketplace, and contribute to the year-round availability of low-cost, safe, and nutritious foods. The FSA's Internet address is [http://www.fsa.usda.gov].

    - *Foreign Agricultural Service (FAS).* FAS serves U.S. agriculture's international interests by expanding export opportunities for U.S. agricultural, fish, and forest products and promoting world food security. FAS's Internet address is [http://www.fas.usda.gov].

    - *Risk Management Agency.* Through its Research and Evaluation Division, the Risk Management Agency researches, develops, and pilots new crop programs, plans of insurance, and risk management strategies; evaluates and makes recommendations for improvement of existing crop programs, plans of insurance, and risk management strategies; and coordinates the development and support for specialty crop programs. The Risk Management Agency's Internet address is [http://www.act. fcic.usda.gov]. The Research and Evaluation Division's Internet address is [http://www.act.fcic.usda.gov/research/index.html].

- **Natural Resources and Environment**

    - *Forest Service.* The Forest Service—the largest forestry research organization in the world—manages public lands in national forests and grasslands. It provides technical and financial assistance to state and private forestry agencies. Congress established the Forest Service in 1905 to provide quality water and timber for the nation's benefit. Over the years, the public has expanded the list of what they want from national

Service to manage national forests for additional multiple uses and benefits and for the sustained yield of renewable resources (i.e., water, forage, wildlife, wood, and recreation). Multiple use means managing resources under the best combination of uses to benefit the American people while ensuring the productivity of the land and protecting the quality of the environment. The Forest Service's Internet address is [http://www.fs.fed.us].

- *Natural Resources Conservation Service (NRCS).* The NRCS works in partnership with the American people to conserve and sustain our natural resources. The NRCS's Internet address is [http://www.nrcs.usda.gov].

- **Documentation and Reporting Systems**

- *Current Research Information System (CRIS).* CRIS is the USDA's computer-based documentation and reporting system for ongoing and recently completed research projects in agriculture, food and nutrition, and forestry. CRIS is designed to provide ready access to information on research conducted primarily within USDA and the state agricultural research system. It contains approximately 30,000 descriptions of current, publicly supported research projects, with approximately 4,000 new projects and 20,000 progress and publication reports added annually. CRIS is updated weekly. Projects are conducted by or sponsored by the USDA's research agencies, state agricultural experimentation stations, the land-grant university system, other cooperating state institutions, and participants in the USDA National Research Initiative Competitive Grants program. CRIS's Internet address is [http://cristel.nal.usda.gov:8080].

GLOSSARY

GLOSSARY

A

ABIS	Advanced Battlespace Information System
ACTD	advanced concept technology demonstration
ADD	Automatic Document Distribution
AEPTR	Advanced Energy Products and Technology Research Division
AFMC	Air Force Materiel Command
AFSIC	Alternative Farming Systems Information Center
AGARD	Advisory Group for Aerospace Research and Development (NATO)
AGRICOLA	Agriculture On-line Access
AGRIS	Agricultural Science and Technology
AHCPR	Agency for Health Care Policy and Research
AHDD	Automatic Hardcopy Document Distribution
AIC	Aquaculture Information Center
AMC	Army Materiel Command
AMPTIAC	Advanced Materials and Process Technology Information Analysis Center
ARC	Ames Research Center
ARS	Agricultural Research Service
ATP	Advanced Technology Program
ATSD NCB	Assistant to the Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs
ATD	advanced technology demonstration
ATMIC	Agricultural Trade and Marketing Information Center

ATP	Advanced Technology Program
ATSDR	Agency for Toxic Substances and Disease Registry
AWIC	Animal Welfare Information Center

B

BEA	Bureau of Economic Analysis
BIC	Biotechnology Information Center
BFRL	Building and Fire Research Laboratory
BMD	Ballistic Missile Defense
BMDO	Ballistic Missile Defense Organization
BRP	Basic Research Plan
BXA	Bureau of Export Administration (DOC)

C

C2	command and control
CAB	Current Awareness Bibliography
CALS	Continuous Acquisition and Life-Cycle Support
CASI	Center for Aerospace Information
CBIAC	Chemical Warfare/Chemical and Biological Defense Information Analysis Center
CD-ROM	compact disc-read only memory
CDC	Center for Disease Control
CFO	Chief Financial Officer
CIA	Central Intelligence Agency
CINC	Commander in Chief
COSSI	Commercial Operations and Support Savings Initiatives
CP/CBD	The Office of Counterproliferation/ Chemical and Biological Defense
CPIA	Chemical Propulsion Information Agency

CPRC	Counterproliferation Program Review Committee
CRIS	Current Research Information System
CRSTIAC	Cold Regions Science and Technology Information Analysis Center
CSERIAC	Crew System Ergonomics Information Analysis Center
CSREES	Cooperative State Research, Education, and Extension Service
CSTL	Chemical Science and Technology Laboratory
CTI	Critical Technologies Institute
CY	calendar year

D

DAB	Defense Acquisition Board
DACS	Data and Analysis Center for Software
DARPA	Defense Advanced Research Projects Agency
DDR&E	Director, Defense Research and Engineering
DELG	Defense Export Loan Guarantee
DFRC	Dryden Flight Research Center
DMSO	Defense Modeling & Simulation Office
DMSTTIAC	Defense Modeling, Simulation, and Tactical Technology Information Analysis Center
DOA	Department of Agriculture
DOC	Department of Commerce
DoD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
DOL	Department of Labor
DOS	Department of State
DOT	Department of Transportation

DP	Defense Programs
DREN	Defense Research and Engineering Network
DROLS	Defense RDT&E Online System
DSN	Deep Space Network
DTAP	Defense Technology Area Plan
DTIC	Defense Technical Information Center
DT&E	Development, Test and Evaluation
DTIW	Defense Technical Information Web
DTO	Defense Technology Objective
DUAP	Dual-Use Applications Program
DUSD I&CP	Deputy Under Secretary of Defense (International and Commercial Programs)
DUSD (Space)	Deputy Under Secretary of Defense for Space
DVBID	Division of Vector-Borne Infectious Diseases

E

E-SCAN	Electronic Selected Current Aerospace Notices
EAC	Engineering and Analytical Center
EC/EDI	Electronic Commerce/Electronic Data Interchange
ECAB	Electronic Current Awareness Bibliography
EDA	Economic Development Administration
EDB	Energy Science and Technology Database
EE	Energy Efficiency and Renewable Energy
EEEL	Electronics and Electrical Engineering Laboratory
EIA	Energy Information Administration
EOS	Earth Observing System
EPA	Environmental Protection Agency

EPUB	Electronic Publishing System
ERS	Economic Research Service
ESE	Earth Science Enterprise
ETDE	Energy Technology Data Exchange

F

FAA	Federal Aviation Administration
FAS	Foreign Agricultural Service
FBIS	Foreign Broadcast Information Service
FCCSET	Federal Coordinating Council of Science, Engineering, and Technology
FDA	Food and Drug Administration
FEDRIP	Federal Research in Progress
FFRDC	Federally Funded Research and Development Center
FNIC	Food and Nutrition Information Center
FOIA	Freedom in Information Act
FSA	Farm Service Agency
FTP	file transfer protocol
FY	fiscal year
FYDP	Fiscal Year Development Program

G

GACIAC	Guidance and Control Information Analysis Center
GILS	Government Information Locator Service
GPS	Global Positioning System
GSFC	Goddard Space Flight Center
GUI	graphical user interface

H

HEDSE	Human Exploration and Development of Space Enterprise
HHS	Health and Human Services
HPC	high-performance computing
HPCC	High-Performance Computing and Communications
HPCMP	High-Performance Computing Modernization Program

I

IAC	Information and Analysis Center
IAEA	International Atomic Energy Agency
IAIN	International Aerospace Information Network
IATAC	Information Assurance Technology Analysis Center
ICSTI	International Council for Scientific and Technical Information
IEA	International Energy Agency
IGM	Internet Grateful Med
INIS	International Nuclear Information System
IR&D	independent research and development
IRIA	Infrared Information Analysis Center
ISO	International Standards Organization
ITA	International Trade Administration

J

JCS	Joint Chiefs of Staff
JPL	Jet Propulsion Laboratory
JSC	Johnson Space Center
JWSTP	Joint Warfighter S&T Plan

K

KSC — Kennedy Space Center

L

LaRC — Langley Research Center

LeRC — Lewis Research Center

LHNCBC — Lister National Center for Biomedical Communications

LM&TT — Laboratory Management and Technology Transition

M

M&S — modeling and simulation

ManTech — Manufacturing Technology Program

MATRIS — Manpower and Training Research Information System

MCTL — Militarily Critical Technologies List

MEDLARS — Medical Literature Analysis and Retrieval System

MEDLINE — MEDlars onLine

MEL — Manufacturing Engineering Laboratory

MEP — Manufacturing Extension Partnership

MILSATCOM — Military Satellite Communications

MMS — MEDLARS Management Section

MPT/HF — manpower, personnel, training, and human factors

MSEL — Materials Science and Engineering Laboratory

MSFC — Marshall Space Flight Center

MSOSA — Modeling and Simulation Operational Support Activity

MSRR — Modeling and Simulation Resource Repository

MTIAC — Manufacturing Technology Information Analysis Center

N

NAL	National Agricultural Library
NASA	National Aeronautics and Space Administration
NASS	National Agricultural Statistics Service
NATIBO	North American Technology and Industrial Base Organization
NATO	North Atlantic Treaty Organization
NBS	National Bureau of Standards
NCA	National Command Authorities
NCB	Nuclear, Chemical, and Biological
NCHS	National Center for Health Statistics
NCID	National Center for Infectious Disease
NCRR	National Center for Research Resources
NCTR	National Center for Toxicological Research
NEIC	National Energy Information Center
NIH	National Institutes of Health
NIST	National Institute of Standards and Technology
NIX	NASA Image eXchange
NLM	National Library of Medicine
NMD	National Missile Defense
NN/LM	National Network of Libraries of Medicine
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NSB	National Science Board
NSF	National Science Foundation
NSTC	National Science and Technology Council
NTIA	National Telecommunications and Information Administration

NTIAC	Nondestructive Testing Information Analysis Center
NTIS	National Technical Information Service
NTRS	NASA Technical Report Server
NTTC	National Technology Transfer Center

O

O&S	operations and support
OASTT	Office of Aeronautics and Space Transportation Technology
OCTR	Office of Computational and Technology Research
OEP	Office of Emergency Preparedness
OER	Office of Energy Research
OMB	Office of Management and Budget
ONR	Office of Naval Research
OPP	Office of Polar Programs
OSD	Office of the Secretary of Defense
OSD (A&T)	Office of the Secretary of Defense (Acquisition and Technology)
OSD (C3I)	Office of the Secretary of Defense (Command, Control Communications, and Intelligence)
OSTI	Office of Scientific and Technical Information
OSTP	Office of Science and Technology Policy
OTP	Office of Technology Policy

P

PCAST	President's Committee on Science and Technology
PE	program element
PGDIC	Plant Genome Data and Information Center
PHS	Public Health Service
POC	point of contact

PTO	Patent and Trademark Office
PUSD (A&T)	Principal Deputy Under Secretary of Defense for Acquisition and Technology

R

R&D	research and development
R&T	research and technology
RAC	Reliability Analysis Center
RaDiUS	Research and Development in the United States
RDT&E	research, development, test, and evaluation
RECON	REsearch CONnection
REE	Research, Education, and Economics
RIC	Rural Information Center
RICHS	RIC Health Services

S

S&T	science and technology
S-STINET	Secure STINET
SADBU	Small and Disadvantaged Business Utilization
SBIR	Small Business Innovation Research
SBIRS	Space-Based Infrared System
SEAB	Secretary of Energy Advisory Board
SERDP	Strategic Environmental Research and Development Program
SIS	Specialized Information Services
SITIS	SBIR Interactive Topic Information System
SRIM	Selected Research in Microfiche
SRS	Science Resource Studies
SSC	Stennis Space Center

SSE	Space Science Enterprise
STAR	Scientific and Technical Aerospace Reports
STC	Science and Technology Center
STI	scientific and technical information
STINE	Science and Technology Internet Service
STINET	Scientific and Technical Information Network
STIP	Scientific and Technical Information Program
STTR	Small Business Technology Transfer
STU	Secure Telephone Unit
SURVIAC	Survivability/Vulnerability Information Analysis Center

T

TA	Technology Administration
TBMD	Theater Ballistic Defense Missile
TDRSS	Tracking and Data Relay Satellite System
TESIS	TEchnology Services Information System
TMD	Theater Missile Defense
TR	Technical Reports
TRGUI	Technical Reports Graphical User Interface
TSD	Technical Service Division
TTIC	Technology Transfer Information Center

U

U.S.	United States
U.S.C.	United States Code
URL	Uniform Resource Locator
USD (A&T)	Under Secretary of Defense for Acquisition and Technology

USD (A&T)   Under Secretary of Defense for Acquisition and Technology

USDA   United States Department of Agriculture

W

WNC   World News Connection

WQIC   Water Quality Information Center

WUIS   Work Unit Information System

WWW or www world wide web

APPENDIX
LIST OF INTERNET ADDRESSES

USG Budget Information	http://www.access.gpo.gov/su_docs/budget/index.html
U.S. Budget Documentation	http://www.dtic.mil/comptroller

I. Department of Commerce (DOC)

DOC	http://www.doc.gov
Bureau of Export Administration (BXA)	http://www.bxa.doc.gov
Economic Development Administration (EDA)	http://www.doc.gov/eda
International Trade Administration (ITA)	http://www.ita.doc.gov
Bureau of Economic Analysis (BEA)	http://www.bea.doc.gov
U.S. Census Bureau	http://www.census.gov
National Oceanic and Atmospheric Administration (NOAA)	http://www.noaa.gov
National Telecommunications and Information Administration (NTIA)	http://www.ntia.doc.gov
Patent and Trademark Office (PTO)	http://www.uspto.gov
Technology Administration (TA)	http://www.ta.doc.gov
National Institute of Standards and Technology (NIST)	http://www.nist.gov
National Technical Information Service (NTIS)	http://www.ntia.doc.gov
The Office of Technology Policy (OTP)	http://www.ta.doc.gov/OTPolicy/default.htm

II. Department of Defense (DoD)

OSD	http://www.defenselink.mil/osd
Under Secretary of Defense for Acquisition and Technology (USD (A&T))	http://www.acq.osd.mil
Principal Deputy Under Secretary of Defense for Acquisition and Technology (PUSD (A&T))	http://www.acq.osd.mil
Directorate of Strategic and Tactical Systems	http://www.acq.osd.mil/sts
Acquisition Program Integration	http://www.acq.osd.mil/api
Deputy Under Secretary of Defense (Advanced Technology)	http://www.acq.osd.mil/at
Director, Defense Research and Engineering (DDR&E)	http://www.dtic.mil/ddre
Defense Advanced Research Projects Agency (DARPA)	http://www.darpa.mil
Defense Modeling and Simulation Office (DMSO)	http://www.dmso.mil
High-Performance Computing and Modernization Office	http://www.hpcmo.hpc.mil
Strategic Environmental Research and Development Program (SERDP)	http://www.hgl.com/SERDP

II. Department of Defense (DoD) (Continued)

Laboratory Management and Technology Transition (LM&TT) Office	http://www.dtic.mil/labman
Dual-Use Applications Program (DUAP)	http://www.darpa.mil/jdupo/duap.html
Commercial Operations and Support Savings Initiatives (COSSI)	http://www.darpa.mil/jdupo/cossi.html
DUAP S&T Initiative	http://www.darpa.mil/jdupo/st.html
Ballistic Missile Defense Organization (BMDO)	http://www.acq.osd.mil/bmdo
Assistant to the Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ATSD (NCB))	http://www.defenselink.mil/osd
Counterproliferation/Chemical and Biological Defense (CP/CBD)	http://www.acq.osd.mil/cp/main.htm
Deputy Under Secretary of Defense for Space (DUSD (Space))	http://www.acq.osd.mil/space
Deputy Under Secretary of Defense (International and Commercial Programs) (DUSD (I&CP))	http://www.acq.osd.mil/icp
Directorate of Armaments Cooperation	http://www.acq.osd.mil/icp/armscoop.html
Small and Disadvantaged Business Utilization (SADBU)	http://www.acq.osd.mil/sadbu
Defense Export Loan Guarantee (DELG) Program	http://www.acq.osd.mil/icp/delg/defexploan.htm

III. Department of Energy (DOE)

DOE	http://www.doe.gov
Office of Energy Research (OER)	http://www.er.doe.gov
The Office of High Energy and Nuclear Physics	http://www.er.doe.gov/production/henp/henp.html
The Office of Basic Energy Sciences	http://www.er.doe.gov/production/bes/bes.html
The Office of Biological and Environmental Research	http://www.er.doe.gov/production/ober/ober_top.html
Fusion Energy Program	http://wwwofe.er.doe.gov
The Office of Planning and Analysis	http://webster.er.doe.gov/er-5/home.html
Office of Computational and Technology Research (OCTR)	http://www.er.doe.gov/production/octr/octr.html
Advanced Energy Products and Technology Research Division	http://www.er.doe.gov/production/octr/aeptr/aeptr_pr.html
Office of Science and Technical Information	http://www.osti.gov
Mathematical, Information, and Computational Division	http://www.er.doe.gov/production/octr/mics/index.html
Office of Defense Programs (DP)	http://www.dp.doe.gov

III. Department of Energy (DOE) (Continued)

Chief Financial Officer (CFO)	http://www.cfo.doe.gov
Energy Efficiency and Renewable Energy (EE) Office	http://www.eren.doe.gov/ee.html
Alternative Fuels Data Center	http://www.afdc.nrel.gov
Energy Technology Data Exchange (ETDE)	http://www.etde.org
International Atomic Energy Agency (IAEA)	http://www.iaea.org
Energy Information Administration (EIA)	http://www.eia.doe.gov

IV. Defense Technical Information Center (DTIC)

DTIC	http://www.dtic.mil
Technical Reports (TR) Database	http://www.dtic.mil/dtic/dtic-o/oc/ocp
Work Unit Information System (WUIS)	http://www.dtic.mil/dtic/dtic-o/wuis.html
Independent Research and Development (IR&D) Database	http://www.dtic.mil/dtic/dtic-o/ird.html
Manpower and Training Research Information System (MATRIS) Database	http://www.dticam.dtic.mil
Current Awareness Bibliography (CAB)/ Electronic Current Awareness Bibliography (ECAB)	http://www.dtic.mil/dtic/cab.html
Technical Reports (TR) Database Bibliographies on CD/ROM	http://www.dtic.mil/dtic/trcdrom.html
Internal Research and Development (IR&D) Database on CD/ROM	http://www.dtic.mil/dtic/irdcdrom.html
The Defense RDT&E On-line System (DROLS)	http://www.dtic.mil/dtic/drols.html
Technical Reports Graphical User Interface (TRGUI)	http://www.dtic.mil/dtic/trgui.html
DTIC Web Links	http://www.dtic.mil/dtic/url.listing.html
Defense Technical Information Web (DTIW)	http://www.dtic.mil/dtiw
The Scientific and Technical Information Network (STINET)	http://www.dtic.mil/stinet
DefenseLINK DoD Information	http://www.defenselink.mil/pubs/ofg.html
Joint-Produced Internet Resources	http://www.dtic.mil/dtic/joint-inet.html
Aerospace Guidance and Metrology Center (AGMC)	http://www.dtic.mil/ozone/fulltext.html
Aerospace in the 21st Century Electronic Bibliography	http://www/dtic.mil.aerospace
AirForceLINK	http://www.af.mil
Army Materiel Command (AMC)	http://www.amc.army.mil
CENDI	http://www.dtic.mil/cendi
Director of Defense Research and Engineering (DDR&E)	http://www.dtic.mil/ddre

IV. Defense Technical Information Center (DTIC) (Continued)

DefenseLINK   http://www.defenselink.mil

DefenseLINK Locator (DoD-GILS)   http://www.defenselink.mil/locator

Defense S&T Planning   http://www.dtic.mil/dstp

DoD Directives and Instructions   http://www.web7.whs.osd.mil/corres.htm

DoD Militarily Critical Technologies List (MCTL)   http://www.dtic.mil/mctl

International Aerospace Information Network (IAIN)   http://www.dtic.mil/iain

International Council for Scientific and Technical
Information (ICSTI)   http://www.cisti.nrc.ca/icsti

Joint Chiefs of Staff (JCS)   http://www.dtic.mil/jcs

LabLINK   http://www.dtic.mil/lablink

MarineLINK   http://www.usmc.mil

North American Technology and Industrial Base
Organization (NATIBO)   http://www.dtic.mil/natibo

Technology Navigator   http://www.dtic.mil/technav

TechTRANSIT   http://www.dtic.mil/techtransit

Information and Analysis Centers (IACs)   http://www.dtic.mil/iac/#home

Advanced Materials and Process Technology Information
Analysis Center (AMPTIAC)   http://www.rome.iitri.com/amptiac

Chemical Warfare/Chemical and Biological Defense Information
Analysis Center (CBIAC)   http://www.cbiac.apgea.army.mil

Chemical Propulsion Information Agency (CPIA)   http://www.jhu.edu/~cpia

Cold Regions Science and Technology
Information Analysis Center (CRSTIAC)   http://www.crrel.usace.army.mil/crstiac/
                                                                          crstiac.html

Crew System Ergonomics Information Analysis Center (CSERIAC)   http://cseriac.flight.wpafb.af.mil

Data and Analysis Center for Software (DACS)   http://www.dacs.dtic.mil

Defense Modeling, Simulation, and Tactical Technology
Information Analysis Center (DMSTTIAC)   http://dmsttiac.hq.iitri.com

Guidance and Control Information Analysis Center (GACIAC)   http://gaciac.iitri.com

Information Assurance Technology Analysis Center (IATAC)   http://www.iatac.dtic.mil/iatac.htm

Infrared Information Analysis Center (IRIA)   http://www.erim.org/IRIA/iria.html

Manufacturing Technology Information Analysis Center (MTIAC)   http://www.mtiac.iitri.com

Nondestructive Testing Information Analysis Center (NTIAC)   http://www.ntiac.com

IV. Defense Technical Information Center (DTIC) (Continued)

Reliability Analysis Center (RAC)	http://www.rome.iitri.com/rac
Survivability/Vulnerability Information Analysis Center (SURVIAC)	http://surviac.flight.wpafb.af.mil

V. Department of Health and Human Services (HHS)

HHS	http://www.hhs.gov
National Institutes of Health (NIH)	http://www.nih.gov
National Library of Medicine	http://www.nlm.nih.gov
Medical Literature Analysis and Retrieval System (MEDLARS)	http://www.nlm.nih.gov/databases/medlars.html
MEDlars onLine (MEDLINE)	http://www.nlm.nih.gov/databases/medline.html
Internet Grateful Med (IGM)	http://igm.nlm.nih.gov
The Division of Specialized Information Services (SIS)	http://www.sis.nlm.nih.gov
The Lister National Center for Biomedical Communications (LHNCBC)	http://www.lhncbc.nlm.nih.gov
The National Center for Research Resources (NCRR)	http://www.ncrr.nih.gov
Food and Drug Administration (FDA)	http://www.fda.gov
Centers for Disease Control	http://www.cdc.gov
National Center for Infectious Disease (NCID)	http://www.cdc.gov/ncidod
National Center for Health Statistics (NCHS)	http://www.cdc.gov/nchswww/products/products.htm
Agency for Toxic Substances and Disease Registry (ATSDR)	http://atsdr1.atsdr.cdc.gov:8080/atsdrhome.html
Office of Emergency Preparedness	http://www.hhs.gov/progorg/ophs/oep.htm
Agency for Health Care Policy and Research (AHCPR)	http://www.ahcpr.gov

VI. National Aeronautics and Space Administration (NASA)

NASA	http://www.nasa.gov
NASA Enterprises	
Aeronautics Enterprise [Office of Aeronautics and Space Transportation Technology (OASTT)]	http://www.hq.nasa.gov/office/aero
Human Exploration and Development of Space Enterprise (HEDS)	http://www.osf.hq.nasa.gov/heds
Earth Science Enterprise (ESE)	http://www.hq.nasa.gov/office/mtpe
Space Science Enterprise	http://www.hq.nasa.gov/office/oss/osshome.htm

VI. National Aeronautics and Space Administration (NASA) (Continued)

NASA Field Centers

Ames Research Center (ARC)	http://www.arc.nasa.gov
Dryden Flight Research Center (DFRC)	http://www.dfrc.nasa.gov/dryden.html
Goddard Space Flight Center	http://www.gsfc.nasa.gov
Lyndon B. Johnson Space Center (JCS)	http://www.jsc.nasa.gov
John F. Kennedy Space Center (KSC)	http://www.ksc.nasa.gov/ksc.html
Langley Research Center (LaRC)	http://www.larc.nasa.gov
Lewis Research Center (LeRC)	http://www.lerc.nasa.gov
George C. Marshall Space Flight Center (MSFC)	http://www.msfc.nasa.gov
John C. Stennis Space Center (SSC)	http://www.ssc.nasa.gov
Jet Propulsion Laboratory (JPL)	http://www.jpl.nasa.gov

NASA Search Internet Homepage — http://www.nasa.gov/search/index.html

NASA Science and Technical Information (STI) Program — http://www.sti.nasa.gov

NASA Technical Reports Server (NTRS) — http://techreports.larc.nasa.gov/cgi-bin/NTRS

Center for AeroSpace Information (CASI)
Technical Report Server (TRS) (RECONselect) — http://www.sti.nasa.gov/RECONselect.html

NASA REsearch CONnection (RECONplus) — http://www.sti.nasa.gov/reconplus/RECONplus.html

Electronic Selected Current Aerospace Notices (E-SCAN) — http://www.sti.nasa.gov/scan/scan.html

STI Program Bibliographic Announcements — http://www.sti.nasa.gov/sti-pubs.html

NASA Image eXchange (NIX) — http://nix.nasa.gov

Technology Transfer: Spinoff Center for AeroSpace Information
Technology Transfer Office — http://www.sti.nasa.gov/tto/spinoff.html

VII. National Institute of Standards and Technology (NIST)

NIST — http://www.nist.gov

NIST's Major Programs

Advanced Technology Program (ATP)	http://www.atp.nist.gov
Manufacturing Extension Partnership (MEP)	http://www.mep.nist.gov
Measurement and Standards Laboratories	http://www.nist.gov/labs2.htm
Building and Fire Research Laboratory (BFRL)	http://www.bfrl.nist.gov

VII. National Institute of Standards and Technology (NIST) (Continued)

Chemical Science and Technology Laboratory (CSTL)	http://www.cstl.nist.gov
Electronics and Electrical Engineering Laboratory	http://www.eeel.nist.gov
Information Technology Laboratory (ITL)	http://www.itl.nist.gov/aboutitl.htm
Manufacturing Engineering Laboratory (MEL)	http://www.mel.nist.gov/melhome.html
Materials Science and Engineering Laboratory (MSEL)	http://www.msel.nist.gov
Physics Laboratory	http://www.physics.nist.gov
National Quality Program	http://www.quality.nist.gov
NIST Virtual Library	http://nvl.nist.gov
NIST Products and Services	http://www.nist.gov/servb.htm
Technology Services	http://ts.nist.gov/ts/htdocs/servprog.htm

VIII. National Science Board (NSB)

NSB	http://www.nsf.gov/nsb/start.htm

IX. National Science Foundation (NSF)

NSF	http://www.nsf.gov
Directorate of Biological Sciences	http://www.nsf.gov/bio
Directorate of Computer Information and Sciences and Engineering	http://www.cise.nsf.gov
Directorate for Crosscutting Programs	http://www.nsf.gov/home/crssprgm
Directorate for Education and Human Resources	http://www.ehr.nsf.gov
Directorate for Engineering	http://www.eng.nsf.gov
Directorate for Geosciences	http://www.geo.nsf.gov
Directorate for Mathematics and Physical Sciences	http://www.nsf.gov/mps/
Office of Polar Programs	http://www.nsf.gov/od/opp
Directorate for Social, Behavioral, and Economic Sciences	http://www.nsf.gov/sbe
Division of International Research and Education	http://www.nsf.gov/sbe/int
Division of Science Resource Studies	http://www.nsf.gov/sbe/srs
Office of Science and Technology Infrastructure	http://www.nsf.gov/od/osti
Science and Technology Center's Homepage	http://www.nsf.gov/od/osti/centers/start.htm
Listing of Science and Technology Centers (STCs)	http://www.nsf.gov/od/osti/centers/stcaward.htm
NSF External Links	http://www.nsf.gov/home/external

X. National Science Foundation (NSF): Science and Engineering Indicators Report

Science and Engineering Indicators Report http://www.nsf.gov/sbe/srs/seind

XI. National Science and Technology Council (NSTC)

NSTC http://www1.whitehouse.gov/WH/EOP/OSTP/
NSTC/html/NSTC_Home.html

XII. National Technical Information Service (NTIS)

NTIS http://www.ntis.gov

NTIS Science and Technology (S&T) Homepage http://www.ntis.gov/scitech/scitech.htm

NTIS Products Catalog http://www.ntis.gov/search.htm

NTIS On-line Subscriptions http://www.ntis.gov/online.htm

NTIS OrderNow Online http://chaos.fedworld.gov/ordernow

NTIS OrderNow CD http://www.ntis.gov/ordnowcd.htm

World News Connection (WNC) http://wnc.fedworld.gov

NTIS Alerts http://www.ntis.gov/yellowbk/1nty169.htm

NTIS Database http://www.ntis.gov/ntisdb.htm

Energy and Science Technology Database (EDB) http://grc.ntis.gov/energy.htm

AgroBase™ Database http://grc.ntis.gov/agrobase.htm

Federal Research in Progress (FEDRIP) database http://grc.ntis.gov/fedrip.htm

FedWorld Information Network http://www.fedworld.gov

Worldtec™ http://worldtec.fedworld.gov

Government Information Locator Service (GILS) http://www.fedworld.gov/gils

XIII. Office of Science and Technology Policy (OSTP)

OSTP http://www.whitehouse.gov/OSTP.html

Environment Division http://www.whitehouse.gov/WH/EOP/OSTP/
Environment/html/Environment.html

National Security and International Affairs Division http://www.whitehouse.gov/WH/EOP/OSTP/
Security/html/Security.html

Science Division http://www.whitehouse.gov/WH/EOP/OSTP/
Science/html/Science.html

XIII. Office of Science and Technology Policy (OSTP) (Continued)

Technology Division   http://www.whitehouse.gov/WH/EOP/OSTP/
Technology/html/Technology.html

XIV. President's Committee of Advisors on Science and Technology (PCAST)

PCAST   http://www.whitehouse.gov/WH/EOP/OSTP/
NSTC/PCAST/pcast.html

XV. Research and Development in the United States (RaDiUS) Database

RaDiUS Database   http://www.rand.org/radius

XVI. United States Department of Agriculture (USDA)

USDA	http://www.usda.gov
Agricultural Research Service (ARS)	http://www.ars.usda.gov
National Agricultural Library (NAL)	http://www.nalusda.gov
Technical Services Division (TSD)	http://www.nalusda.gov/tsd
NAL Centers	
Agricultural Trade and Marketing Information Center (ATMIC)	http://www.nalusda.gov/atmic/index.html
Alternative Farming Systems Information Center (AFSIC)	http://www.nalusda.gov/afsic/index.html
Animal Welfare Information Center (AWIC)	http://www.nalusda.gov/awic/index.html
Biotechnology Information Center (BIC)	http://www.nalusda.gov/bic/index.html
Food and Nutrition Information Center (FNIC)	http://www.nalusda.gov/fnic/index.html
Plant Genome Data and information Center (PGDIC)	http://www.nalusda.gov/pgdic/index.html
Rural Information Center (RIC) and RIC Health Services (RICHS)	http://www.nalusda.gov/ric/richs/index.html
Technology Transfer Information Center (TTIC)	http://www.nalusda.gov/ttic/index.html
Water Quality Information Center (WQIC)	http://www.nalusda.gov/wqic/index.html
Cooperative State Research, Education, and Extension Service (CSREES)	http://www.reeusda.gov
Economic Research Service (ERS)	http://www.econ.ag.gov
National Agricultural Statistics Service (NASS)	http://www.usda.gov/nass
Farm Service Agency (FSA)	http://www.fsa.usda.gov
Foreign Agricultural Service (FAS)	http://www.fas.usda.gov

XVI. United States Department of Agriculture (USDA) (Continued)

Risk Management Agency	http://www.act.fcic.usda.gov
Research and Evaluation Division	http://www.act.fcic.usda.gov/research/index.html
Forest Service	http://www.fs.fed.us
Natural Resources Conservation Service	http://www.nrcs.usda.gov
Current Research Information System (CRIS)	http://cristel.nal.usda.gov:8080

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13. ABSTRACT *(Maximum 180 words)*
The federal government obligates approximately $70 billion every year for research and development (R&D). There are 25 federal departments and agencies funding science and technology (S&T) programs; however, only 7 account for the vast majority (about 95 percent) of annual federal R&D authorizations for federally supported activities. This document profiles these seven agencies—the Department of Defense (DoD); the Department of Health and Human Services (HHS); the National Areonautics and Space Administration (NASA); the Department of Energy (DOE); the National Science Foundation (NSF); the United States Department of Agriculture (USDA); and the Department of Commerce (DOC)—plus eight other government S&T resources. It is intended as a starter set to help users locate U.S. government technology information. For convenience, it uses Internet addresses, e-mail addresses, and telephone numbers. The Appendix contains a list of Internet addresses for departments/agencies/programs called out in this document.

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